Sustainable development in the European Union

MONITORING REPORT ON PROGRESS TOWARDS THE SDGS IN AN EU CONTEXT

2018 edition

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Printed by Imprimerie Bietlot in Belgium

Manuscript completed in September 2018

Luxembourg: Publications Office of the European Union, 2018

Print	ISBN 978-92-79-88745-1	doi:10.2785/221211	KS-01-18-656-EN-C
PDF	ISBN 978-92-79-88744-4	doi:10.2785/401485	KS-01-18-656-EN-N

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Foreword of First Vice-President Timmermans and Commissioner Thyssen

Our world is increasingly interconnected. Global challenges such as growing inequalities, climate change, conflicts and degradation of our natural environment, cannot be solved by any single state acting alone and call for joint action. The UN 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals, adopted by more than 150 world leaders in September 2015, are an ambitious and comprehensive response to these challenges.

The European project is a living example of how shared values and aspirations, such as peace, freedom, tolerance, solidarity, inclusive economic growth and environmental protection can serve both national and collective interests. Sustainable development is firmly enshrined in the EU Treaties and we are fully committed to being frontrunners in implementing the 2030 Agenda for Sustainable Development.

The wellbeing of this and future generations, and of our European Union and our planet, depends on the progress we make in achieving inclusive and green economic development, in full respect of democracy, rule of law and fundamental rights. With the Sustainable Development Goals and the Paris Agreement on climate change as the foundation, the European Commission has launched an open debate on a long-term vision towards a sustainable Europe that ensures a good life and well-being for all, within our planet's limits. This vision should guide our actions in every area, be it our growth strategy, our social priorities, our energy and climate goals, or our research and innovation programmes.

Knowing where we stand, identifying the most relevant sustainability concerns and monitoring our progress are the first steps towards a sustainable Europe and a sustainable world. In this respect, Eurostat's monitoring reports on the Sustainable Development Goals provide essential evidence on where to focus our efforts in order to achieve these goals and make informed policy choices.

Frans Timmermans
First Vice-President
European Commission

Marianne Thyssen
Commissioner
European Commission
Employment, Social Affairs,
Skills and Labour Mobility
Responsible for Eurostat

Foreword of Eurostat's Director-General

In June 2017, the European Council reaffirmed the EU's intention to continue to be a frontrunner in implementing the 2030 Agenda and the Sustainable Development Goals (SDGs), together with its Member States. This intention was first expressed in the European Commission's Communication 'Next steps for a sustainable European future: European action for sustainability' in November 2016.

Both the European Commission and the European Council called for a detailed regular monitoring of the SDGs in an EU context, and the development of a reference indicator framework for this purpose. Eurostat answered this call by developing an EU SDG indicator set in close cooperation with other European Commission services, statistical authorities in the EU Member States and a wide range of users and stakeholders. Based on this indicator set, the first edition of the monitoring report was released in November 2017.

This 2018 edition of the report is based on a slightly revised EU SDG indicator set, which takes into account recent policy developments and improved indicator availability. The set still comprises 100 indicators relevant for monitoring progress towards the SDGs in an EU context, and is structured along the 17 SDG goals.

The report shows that the EU has achieved progress towards many sustainable development objectives, but also points to areas where the EU has moved away from these objectives.

I hope that the 2018 monitoring report will be useful to interested European citizens, policy-makers, researchers and business people. It should help them to identify the main challenges the EU is facing at this moment and inspire them to undertake new sustainable development actions.

Mariana Kotzeva
Director-General of Eurostat

Acknowledgements

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Data coverage and direct links to Eurostat's database:

The data presented in this publication were extracted in late August 2018.

An online data code available under each table/figure can be used to directly access to the most recent data on Eurostat's website, at:

https://ec.europa.eu/eurostat/data/database

For more information please consult:

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Disclaimer

Synopsis

Sustainable development objectives have been at the heart of European policy for a long time, firmly anchored in the European Treaties ([1]) and mainstreamed in key projects, sectoral policies and initiatives. The 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), adopted by the United Nations (UN) in September 2015, have given a new impetus to global efforts for achieving sustainable development. The EU is committed to playing an active role to maximise progress towards the SDGs, as outlined in its Communication (COM (2016) 739) 'Next steps for a sustainable European future' ([2]).

The Communication provides for regular monitoring of progress towards the SDGs in an EU context. This publication entitled 'Sustainable development in the European Union — Monitoring report on progress towards the SDGs in an EU context' is the second of these regular monitoring exercises. It is based on the EU SDG indicator set that was developed to monitor progress towards the SDGs in an EU context. The set was adopted in May 2017 by the European Statistical System Committee and reviewed in early 2018 ([3]) (see Annex II on page 340 for the complete set of indicators used in this report).

The aim of this publication is to monitor progress towards the SDGs in an EU context. The indicators selected have strong links with key EU policies as described in the above-mentioned Commission Communication and the accompanying Commission Staff Working Document 'Key European action supporting the 2030 Agenda and the Sustainable Development Goals' ([4]).

This synopsis chapter provides a statistical overview of progress towards the SDGs in the EU over the most recent five-year period ('short-term') for each of the 100 indicators chosen. Where data availability allows, the more detailed analyses in the thematic chapters of this report also look at trends over the past 15 years ('long-term'), to reflect the 15-year scope of the 2030 Agenda.

The indicator trends are assessed on the basis of their average growth rate during the past five years. For indicators with quantitative EU targets, progress towards those targets is assessed. This applies to 17 out of the 100 indicators, mainly in the areas of climate change, energy consumption, education, poverty and employment. All other indicators are analysed according to the direction and speed of change.

The assessment of indicator trends is visualised in the form of arrows, which show whether the indicator has moved in the desired direction or away from it, as well as the speed of this movement. The meaning of the arrow symbols — depending on the presence or absence of a quantitative EU target — is explained in the introduction and at the beginning of each thematic chapter. The overall approach to assessing indicator trends that is applied in this report is explained in more detail in the Introduction (see page 23).

For each SDG, this synopsis summarises progress of the selected indicators towards the respective

goal. This is based on an average score for each SDG, which is obtained by calculating the mean of the individual indicator assessments, including the multipurpose indicators. The method for summarising progress at the goal level based on the selected indicators is explained in the Introduction (see page 25).

The findings presented in this publication are based on developments over a five-year time span. Studies and reports that consider current status (in addition to or instead of trends), different indicators or different time spans may come to different conclusions.

How has the EU progressed towards the SDGs?

The figure on the opposite page shows a statistical summary of EU progress towards the SDGs over the most recent five years of available data ([5]) based on the average scores of the indicators selected for monitoring these goals in an EU context. Over this five-year period, the EU made progress towards almost all goals. Progress in some goals has been faster than in others, and within goals, movement away from the sustainable development objectives also occurred in specific areas. A more detailed description of individual indicator trends can be found in the 17 thematic chapters of this report.

As the figure shows, EU progress over the past five years appears to have been strongest for SDG 3 'Good health and well-being', followed by SDG 4 'Quality education' and SDG 7 'Affordable and clean energy'.

The EU also made progress towards SDG 11 'Sustainable cities and communities', SDG 12 'Responsible consumption and production', SDG 5 'Gender equality', SDG 8 'Decent work and economic growth', SDG 17 'Partnership for the goals', SDG 1 'No poverty' and, to a minor extent, SDG 15 'Life on land' and SDG 2 'Zero hunger'. SDG 9 'Industry, innovation and infrastructure' is characterised by an equal number of positive and negative developments of the indicators.

Making progress towards a given goal does not necessarily mean the status of that goal is satisfactory for the EU. For example, in the case of SDG 15, which focuses on terrestrial ecosystems, the indicators chosen partly show good progress, but this should not lead to the conclusion that ecosystems or biodiversity in the EU are in good health. In the case of SDG 2, emphasis was put on environmental indicators because food security does not pose a major concern in the EU.

Based on the selected indicators, the EU appears to have moved away from the sustainable development objectives for SDG 10 'Reduced inequalities' over the past five years. This is due to the continued rise of income inequalities within Member States — a trend that has been visible since 2005.

In the case of the four remaining goals — SDG 6 'Clean water and sanitation', SDG 13 'Climate action', SDG 14 'Life below water' and SDG 16 'Peace, justice and strong institutions' — trends cannot be calculated due to insufficient data for the past five years.

Summary at goal level

The goals are presented in order of average indicator trend assessments, from best to worst.

The EU has made significant progress towards the areas covered by the indicators in **SDG 3 'Good health and well-being'**. The overall assessment has improved compared to last year's report because enough data are now available to assess the trend for smoking prevalence, which has been decreasing. Furthermore, there was a significant improvement in access to health care. Over the past five years, progress is also visible in almost all other health-related areas, as shown by improvements in life expectancy at birth, death rates due to chronic diseases and due to specific communicable diseases, and accidents at work. Similarly, health determinants such as the exposure to air pollution by particulate matter and noise pollution have shown decreasing trends. However, short-term developments have been moderately unfavourable in the area of self-perceived health.


significant progress
3 Good health and well-being
4 Quality education
11 Sustainable cities and communities
5 Gender equality
7 Affordable and clean energy
1 No poverty
12 Responsible consumption and production
2 Zero hunger
8 Decent work and economic growth
17 Partnerships for the goals
15 Life on land
9 Industry, innovation and infrastructure
10 Reduced inequalities
moderate movement away
moderate progress
Goals for which trends cannot be calculated (*)
6 Clean water and sanitation
13 Climate action
14 Life below water
16 Peace, justice and strong institutions
(*) Due to lack of time series for more than 25% of the indicators

In addition, the EU is not on track to meet the target of halving the number of people killed in road accidents by 2020 compared to 2010.

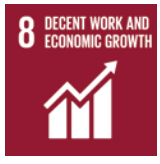
Looking at **SDG 4 'Quality education'**, the EU has achieved significant progress towards four of its six 2020 benchmarks for education and training. The improved picture compared to last year's report is mainly due to a further increase in the employment rate of recent graduates. In addition, more children are participating in early childhood education and care, fewer pupils are leaving school early and more people are attaining a tertiary education than five years ago. In contrast to these positive developments, however, education outcomes as measured by pupils' performance in the PISA study for reading, maths and science are still below the EU target, and the EU does not seem to be on track to meeting its 2020 benchmark for adult participation in learning.

EU progress is visible in almost all areas related to **SDG 7 'Affordable and clean energy'**. The EU reduced its energy consumption of primary and final energy and improved its energy productivity while increasing the share of renewable energies. These developments have gone hand in hand with a slight decline in the energy dependence on imports from outside the EU. Moreover, EU citizens reduced their energy consumption at home, and more people were able to keep their home adequately warm. However, more efforts are needed to reach the 2020 energy efficiency target.

Indicators related to **SDG 11 'Sustainable cities and communities'** mostly show progress towards sustainable development objectives. Quality of life in cities and communities has seen particular improvements: fewer Europeans live in deprived or overcrowded housing conditions, suffer from noise or air pollution by particulate matter or feel affected by crime, violence and vandalism. Furthermore, the EU has made great strides in increasing the recycling rate of municipal waste. On the other hand, progress in the area of sustainable transport has been less pronounced. While the share of buses and trains in total passenger transport increased slightly in the past few years, the decrease in the number of fatal road accidents has slowed. This puts the EU off track towards meeting the target of halving the number of people killed between 2010 and 2020. Also, artificial land cover per capita is increasing.

Concerning **SDG 12 'Responsible consumption and production'**, the EU has achieved considerable gains in resource and energy productivity as well as in circular material use. It is also on track to meet its 2020 target for the share of renewable energy. Progress has been more moderate for waste generation and treatment, consumption of toxic chemicals, and CO_2 emissions from new passenger cars. For energy efficiency, more efforts are needed to reach the 2020 efficiency target.

SDG 5 'Gender equality' is characterised by diverse developments in the selected indicators. Both the gender employment gap (in total and for recent graduates) and the gender pay gap have narrowed over the past few years. Also, while the proportions of women in national parliaments and in senior management positions of the largest listed companies have grown considerably, they still remain far from parity. Trends in the area of education, where women are ahead of men, are mixed. While men have been catching up with women in reducing the share of early leavers from education, they have fallen behind in attaining tertiary education. However, many more women than men still remain economically inactive due to caring responsibilities, and this gender gap has even widened further.



Improvements in the EU's economic and labour market situations over the past few years are clearly reflected in the trends related to **SDG 8 'Decent work and economic growth'**. The

improved picture compared to the 2017 assessment is mainly due to better performances in GDP per capita and the long-term unemployment rate. Furthermore, the indicator set has been revised to include the investment share of GDP, where the short-term trend is also moderately positive. In the area of sustainable economic growth, the EU has also significantly increased its resource productivity. Regarding the EU's labour market, the number of young people not in education, employment or training is declining as well. In addition, a continued rise in the employment rate means the EU is almost on track to meeting the Europe 2020 target of 75 % by 2020. However, not all people have benefitted equally from these improvements, as many more women than men still remain economically inactive due to caring responsibilities. Similarly, the prevalence of in-work poverty has risen considerably.

The developments in relation to **SDG 17 'Partnership for the goals'** have not been uniform. Trends in official development assistance (ODA) are positive, although the EU has some way to go to meet its target of dedicating a share of 0.7 % of its gross national income to ODA by 2030. Also, imports from developing countries are still growing, particularly from China. On the other hand, total EU financing to developing countries, an indicator which is subject to strong annual fluctuations, has shown an unfavourable trend, mainly due to shrinking private flows. Concerning financial governance within the EU, Member States have reduced their government debts, expressed as a share of GDP. However, shares of environmental taxes in total tax revenues have stagnated at a low level.

SDG 1 'No poverty' has also shown diverse trends over the past five years. The EU made significant progress towards meeting the basic needs of its citizens. Fewer people face problems related to their homes, such as living in an overcrowded home or in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor, or without a bath, shower or indoor flushing toilet. The number of people unable to keep their home adequately warm has decreased as well. Furthermore, the number of people reporting an unmet need for medical care has decreased. In the area of multidimensional poverty, the number of people suffering from severe material deprivation has decreased and fewer people live in households with very low work intensity. Nevertheless, the share of people at risk of poverty after social transfers is increasing. Taken together, this means that despite recent improvements the EU is still far from being on track to meeting its target of lifting at least 20 million people out of the risk of poverty or social exclusion by 2020.

The indicators selected for **SDG 15 'Life on land'** show a mixed picture. The deteriorating assessment compared to last year's report is mainly due to the inclusion of the butterfly index, which shows a continued and severe decline of Europe's grassland butterfly populations. Furthermore, artificial land cover per capita has increased, with the rate of land take and soil sealing further accelerating. Developments in water quality are mixed; while biochemical oxygen demand in rivers and nitrate concentrations in groundwater are decreasing, phosphate concentrations in European rivers have recently started to rise again. On the plus side, the share of forest area in the EU is increasing, as is the surface of terrestrial Natura 2000 sites. Also, the decline in the number of common bird species has stopped to some extent. However, please note that the selected indicators in this goal have a somewhat limited scope. Other stocktaking reports and evaluations conclude that the status of ecosystems and biodiversity in the EU is insufficient, and that the negative impacts of EU consumption patterns on global biodiversity are considerable ([6]).

As there are no major issues about food security within the EU, monitoring **SDG 2 'Zero hunger'** in an EU context mainly focuses on the sustainability of agricultural production and its adverse

environmental impacts. Both areas show diverse trends. The labour productivity of the EU's agricultural sector has improved and the area under organic farming is increasing. On the other hand, public investments in agricultural R&D are declining. Moreover, despite the continued spread of organic farming practices, some adverse impacts of agricultural production are increasing, as evidenced by the severe declines in the common farmland bird and grassland butterfly populations. Furthermore, ammonia emissions from agriculture have been increasing.

As regards **SDG 9 'Industry, innovation and infrastructure'**, the deteriorated assessment compared to last year's report is mainly due to the fact that the share of rail and inland waterways in freight transport as well as the number of patent applications to the European Patent office have both decreased further. Moreover, while the average CO_2 emissions from new cars are still decreasing, the speed of progress has slowed. The EU has also remained far from being on track to meeting its target of raising R&D intensity to 3 % of GDP by 2020. On a more positive note, the share of R&D personnel and the number of people working in high- and medium-high technology and knowledge-intensive service sectors have grown continuously. In addition, the share of buses and trains in transport has increased slightly.

In **SDG 10 'Reduced inequalities'**, the selected indicators point towards a decrease of inequality between countries and an increase of inequality within countries. Concerning inequalities between countries, both GDP per capita and gross disposable household income per capita show a convergence of EU Member States over the past few years. Imports from developing countries have increased, while financing to developing countries has decreased. On the other hand, inequalities within countries — measured in terms of income inequality — have generally increased over the past few years. Income inequalities between the richest and the poorest groups of society have intensified, with the income share of the bottom 40 % of the population decreasing. Alongside the increase in the number of people earning an income below the poverty threshold (who are therefore considered at risk of income poverty), the average distance from the poverty threshold for those below the poverty threshold has grown considerably, making it more difficult for these people to escape this situation.

For the following four SDGs, average scores at goal level cannot be calculated due to insufficient data over the past five years.

For **SDG 6 'Clean water and sanitation'**, EU aggregate data is not available for several indicators. This makes it impossible to calculate an average score at goal level. However, the share of people without improved sanitation facilities in their households has been steadily decreasing in the EU, with the vast majority of Member States already having universal access to sanitation. Europeans are also enjoying improved bathing water quality in inland waters. Improvements in freshwater quality of European rivers are mixed; while the biochemical oxygen demand continued to fall, phosphate concentrations have started to rise in recent years. Nitrate concentrations in European groundwater bodies are within EU drinking-water standards (50 mg/l) on average, but this does not reflect the fact that nitrate concentrations might still pose serious problems at the regional or local level.

For SDG **13 'Climate action'**, data coverage is sufficient for the topic of climate mitigation only, while data availability for climate impacts and for initiatives providing support to climate actions is not sufficient to assess trends. Indicators in the area of climate mitigation predominantly show progress, with the EU being well on track to reaching its 2020 targets for greenhouse gas emissions and renewable energies. However, progress towards the target for CO_2 emissions from new passenger cars has stalled in recent years, and

more effort is needed to reach the 2020 energy efficiency target.

Available data for **SDG 14 'Life below water'** still have a somewhat limited scope, which makes it impossible to calculate an average score at the goal level. The existing data mostly show progress over the past five years. While an ever-larger marine territory is protected under the Natura 2000 network, the available data do not provide an indication on the effectiveness of the protection of species and habitats at the sites nor on their conservation status. Similarly, model-based indicators on sustainable fishery provide an (improving) picture only for the North-East Atlantic, while data for other EU waters such as the Mediterranean or the Black Sea (where the situation may be less favorable) are not yet robust enough to be considered for monitoring. Finally, the increase in the share of coastal bathing sites with excellent water quality has slowed in recent years, but overall the trend is still moderately positive.

The indicators for **SDG 16 'Peace, justice and strong institutions'** show that life in the EU has become safer over the past few years: deaths due to homicide or assault and the perceived occurrence of crime, violence and vandalism in European neighbourhoods have both fallen considerably. Furthermore, government expenditure on law courts has increased. In addition, the decline in citizens' confidence in EU institutions observable since 2000 has come to a halt, with slight gains in trust levels for the main EU bodies since 2012. However, trends cannot be calculated for other SDG 16 issues, including the perceived independence of the justice system, perceived corruption and violence against women.

Notes

(1) Articles 3 (5) and 21 (2) of the Treaty on European Union (TEU).
(2) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739.
(3) For details, see Review of the EU SDG indicator set on the Eurostat website.
(4) European Commission (2016), *Key European action supporting the 2030 Agenda and the Sustainable Development Goals*, SWD(2016) 390 final.
(5) The presentation is based on the assessment of the trends over the past 5 years ('short term') only. For future monitoring it is envisaged to expand it to 'long-term' development (15 years) depending on the availability of longer time series.
(6) See European Environment Agency (2015), *State of nature in the EU: biodiversity still being eroded, but some local improvements observed* and European Commission (2015), *The mid-term review of the EU Biodiversity Strategy to 2020*, COM(2015) 478 final.

Introduction

1. About this publication

Sustainable development objectives have been at the heart of European policy for a long time, firmly anchored in the European Treaties ([1]) and mainstreamed in key projects, sectoral policies and initiatives. The 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), adopted by the United Nations (UN) in September 2015, have given a new impetus to global efforts towards achieving sustainable development. The EU and its Member States are committed to this historic global framework agreement and to playing an active role to maximise progress towards the SDGs.

Eurostat supports this process through regular monitoring and reporting on progress towards the SDGs in an EU context. This publication is the second edition of Eurostat's series of monitoring reports, which provide a quantitative assessment of the EU's progress towards reaching the SDGs.

This publication is based on the EU SDG indicator set (see section 3.1, page 21), which includes indicators relevant to the EU and enables the monitoring of progress towards the goals in the context of long-term EU policies. It is aligned as far as appropriate with the UN list of global indicators.

This 2018 edition of the EU SDG monitoring report begins with a synopsis of the EU's overall progress towards the SDGs, followed by a presentation of the policy background at global and EU level and the way the SDGs are monitored at EU level (see 'policy background' and 'monitoring sustainable development in the EU' sections below). The detailed monitoring results are presented in 17 chapters, one for each of the 17 SDGs. The complete set of indicators used in this publication, as well as notes on methods and sources are presented in Annex II (see page 340).

2. Policy background

2.1 The 2030 Agenda for Sustainable Development

'Development which meets the needs of the current generations without compromising the ability of future generations to meet their own needs' ([2]). This is the definition of sustainable development that was first introduced in the Brundtland report ([3]) by the World Commission on Environment and Development (WCED) in 1987, and it is the most widely used nowadays. Following the Brundtland report, the UN Conference on Environment and Development (Rio Earth Summit), the Millennium Declaration (from which the Millennium

Figure 0.1: The road to the Agenda 2030

Development Goals were derived) and the UN Conference on Sustainable Development (Rio+20) were three of the most important milestones in the international pursuit of sustainable development, which paved the way forward for the 2030 Agenda (see Figure 0.1).

In September 2015, the UN General Assembly (UNGA) adopted the 'Transforming our world: the 2030 Agenda for Sustainable Development' document ([4]). The 2030 Agenda is the new global sustainable development agenda. At the core of the 2030 Agenda is a list of 17 SDGs (see Box 0.1) and 169 related targets to end poverty, protect the planet, and ensure prosperity and peace. The Agenda also calls for a revitalised global partnership to ensure its implementation. The SDGs are unprecedented in terms of significance and scope and go far beyond the Millennium Development Goals by setting a wide range of economic, social and environmental objectives and calling for action by all countries, poor, rich and middle-income. The Agenda emphasises that strategies for ending poverty and promoting sustainable development for all must go hand-in-hand with actions that address a wider range of social needs and which foster peaceful, just and inclusive societies, protect the environment and help tackle climate change. Although the SDGs are not legally binding, governments are expected to take ownership and establish national frameworks for the achievement of the 17 goals.

Monitoring of the SDGs is foreseen to take place at various levels — national, regional, global and thematic. The High-Level Political Forum is the UN's central platform to follow up and review the 2030 Agenda and the SDGs at the global level. To this end, the 2030 Agenda encourages UN member states to conduct voluntary national reviews of progress towards the SDGs ([5]). Regular reviews by the High-Level Political Forum are to be voluntary, state-led, undertaken by both developed and developing countries, and shall provide a platform for partnerships, including through the participation of major groups and other relevant stakeholders ([6]). In view of this, many countries are updating their national sustainable development strategies based on the 2030 Agenda ([7]).

In June 2016, the UN released a first Report of the Secretary-General on 'Progress towards the Sustainable Development Goals' ([8]), followed by a glossy SDG report for the broader public ([9]). The latter provides an overview of progress on each of the 17 SDGs based on selected indicators from the global indicator framework. The most recent editions of both reports were published in May and June 2018 ([10]), respectively.

The 2030 Agenda (paragraph 75) foresees establishing a set of global indicators to follow up and review the goals and targets. An Inter-Agency and Expert Group on SDG indicators was created to carry out this task, under the supervision of the UN Statistical Commission (UNSC) ([11]).

In July 2017, the UNGA adopted a global indicator list, including 232 different indicators ([12]). These indicators cover all the 169 targets of the 2030 Agenda (as some indicators are used to monitor more than one target, the list overall includes 244 indicators). However, only 40 % of those indicators are ready to use (these are classified as tier 1 by the UNSC); for a further 31 % data are available only for a limited number of countries worldwide (tier 2), and for the remaining part a methodology still has to be agreed (tier 3). There are data gaps not only in developing countries, but also in developed nations, and filling these gaps requires financial resources as well as knowledge sharing and investments in human capital. The UNSC anticipates the possibility of yearly refinements to the global indicator list, with two comprehensive

reviews in 2020 and in 2025. The Inter-Agency and Expert Group on SDG indicators is now working to fully implement the global indicator list and to improve it further. This includes supervising the methodological work to develop the tier 3 indicators and the extension of data coverage, as well as identifying possible additional indicators to include in a comprehensive review of the indicator set in 2020.

Achieving the SDGs around the world critically depends on a global partnership to enable the mobilisation of means of implementation, including financial and non-financial resources. Therefore, in addition to the definition of the SDGs and targets and the development of a global indicator list, the mobilisation of resources for sustainable development is another important element of the 2030 Agenda. A main milestone in the intergovernmental negotiations for financing sustainable development was the Third International Conference on Financing for Development, which took place in July 2015 in Addis Ababa, Ethiopia. The conference adopted an outcome document that presents concrete actions for mobilising means of implementation as an integral part of the 2030 Agenda, the Addis Ababa Action Agenda ([13]).

Box 0.1: List of SDGs adopted by the UN General Assembly in September 2015

Paragraph 54 of the United Nations Resolution A/RES/70/1 of 25 September 2015 sets out the following 17 Global Goals, together with 169 targets:

Goal 1. End poverty in all its forms everywhere

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3. Ensure healthy lives and promote well-being for all at all ages

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 5. Achieve gender equality and empower all women and girls

Goal 6. Ensure availability and sustainable management of water and sanitation for all

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

Goal 10. Reduce inequality within and among countries

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12. Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts ([14])

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17. Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development

The 2030 Agenda foresees that global indicators are complemented by indicators at the level of UN world regions and at national level. At the European level, the UN Economic Commission for Europe (UNECE) developed a Roadmap on Statistics for Sustainable Development Goals in July 2017 ([15]). The roadmap includes six substantive sections, focusing on (a) establishing mechanisms for national collaboration; (b) assessing the readiness of countries to produce global SDG indicators; (c) developing regional, national and sub-national indicators; (d) mechanisms for providing data on SDG indicators; (e) capacity building; and (f) communicating statistics for SDGs. It includes recommendations for national statistical offices and concrete actions to support the Conference of European Statisticians member countries in implementing a measurement system for the SDGs ([16]). There is no separate regional indicator set proposed by the UNECE; however, the EU SDG indicator set as described in section 3.1 is in line with the UNECE roadmap.

2.2 Sustainable development in the European Union

Sustainable development has long been a central policy objective for the European Union, enshrined in its treaties since 1997. The first EU Sustainable Development Strategy, adopted in 2001 ([17]), set out a single, coherent plan on how to meet the challenges of sustainable development in the EU. The strategy was revised in 2006 ([18]) and later reviewed in 2009 ([19]), reaffirming the overall aim of a continuous improvement in the quality of life of citizens while ensuring prosperity, environmental protection and social cohesion.

On 17 June 2010, the European Council adopted the Europe 2020 strategy, the EU's agenda for growth and jobs for the current decade ([20]). The Europe 2020 strategy put forward the three mutually reinforcing priorities of smart, sustainable and inclusive growth. For each of the three priorities, the strategy defined one or more targets in five areas: employment, research and development (R&D) and innovation, climate change and energy, education, and poverty and social exclusion ([21]). The eight targets adopted under the three key priorities recognised the economic, social and environmental dimensions of sustainable development by bringing policy focus on education and innovation, low-carbon emissions, climate resilience and environmental impact, and job creation and poverty reduction.

In response to the UN 2030 Agenda for Sustainable Development, the Commission adopted its Communication 'Next steps for a sustainable European future: European action for sustainability' ([22]) in November 2016, announcing a two-step approach towards the implementation of the SDGs. The first work stream is to fully integrate the SDGs into the European policy framework and Commission priorities. The second work stream is a reflection on further developing the EU's longer-term vision after 2020. In this respect, the Commission is currently working on a reflection paper, 'Towards a Sustainable Europe by 2030', on the follow-up to the UN SDGs and to the Paris Agreement on Climate Change.

This Communication also announced a detailed regular monitoring of the SDGs in an EU context from 2017 onwards, developing a reference indicator framework for this purpose and drawing on the wide range of ongoing monitoring and assessment across the Commission, agencies, European External Action Service and Member States. In May 2017, the EU SDG indicator set was established (see next section), and on this basis the first annual monitoring report was published in November 2017 ([23]). The EU SDG monitoring reports describe progress towards achieving the SDGs in an EU context and supplement other EU reports on individual policy areas.

The Communication 'Next steps for a sustainable European future: European action for sustainability' also announced the creation of a multi-stakeholder platform on the SDGs, with the aim of supporting and advising the European Commission on the implementation of SDGs at EU level. The platform had its first meeting in January 2018, bringing together stakeholders from civil society, non-governmental organisations and the private and corporate sector. Since then it has

been very active, among other things advising the Commission on the upcoming reflection paper 'Towards a Sustainable Europe by 2030'.

Additionally, in June 2017 a new European Consensus on Development, 'Our world, our dignity, our future' was adopted by the Council, the Member States, the European Parliament and the Commission. It is a shared vision and framework for development cooperation for the EU and its Member States and aligns the Union's development policy with the 2030 Agenda for Sustainable Development.

On 20 June 2017, the Council adopted conclusions on 'A sustainable European future: The EU response to the 2030 Agenda for Sustainable Development' ([24]) and called on the Commission to carry out detailed regular monitoring of the SDGs at EU level.

3. Monitoring sustainable development in the EU

3.1 The EU SDG indicator set

The European Commission is committed to monitoring progress towards the SDGs in an EU context. Eurostat has led the development of a reference indicator framework for this purpose in close cooperation with other Commission services and with Member States organisations in the European Statistical System (ESS). Work on the selection of an EU SDG indicator list has been carried out in an open and inclusive way, involving Council Committees (Employment Committee, Social Protection Committee and Economic and Financial Committee), the European Statistical Advisory Committee (ESAC), agencies such as the European Environment Agency (EEA), non-governmental organisations, academia and other international organisations. Many proposals have been screened in the light of pre-established principles and criteria on policy relevance and quality requirements. The European Statistical System Committee adopted the EU SDG indicator set in May 2017.

The indicators have been selected taking into account their policy relevance from an EU perspective, availability, country coverage, data freshness and quality. With a few exceptions, the indicators stem from already existing indicator sets used for monitoring long-term EU policies, such as the Europe 2020 headline indicators ([25]), the set of impact indicators for the Strategic Plan 2016-2020 (10 Commission priorities) ([26]), and the main indicators of the Social Scoreboard for the European Pillar of Social Rights ([27]). Policies and initiatives to be monitored are listed in the staff working document 'Key European action supporting the 2030 Agenda and the Sustainable Development' ([28]), accompanying the Communication COM (2016) 739 'Next steps for a sustainable European future: European action for sustainability' ([29]). Elements of the 2030 Agenda that are less relevant for the EU because they focus on other parts of the world (for instance where targets specifically refer to developing countries) are not considered.

The set is structured along the 17 SDGs and covers the social, economic, environmental and institutional dimensions of sustainability as represented by the Agenda 2030. The 100 indicators are evenly distributed across the 17 goals, which means that each SDG has five or six main indicators. They are selected to reflect the SDGs' broad objectives and ambitions. Forty-two indicators are 'multi-purpose', meaning they are used to monitor more than one goal. This allows the link between different goals to be highlighted and enhances the narrative of this monitoring report. Out of the 100 EU SDG indicators, 55 are currently aligned with the UN SDG indicators.

The EU SDG indicator set is open to annual reviews to consider future policy developments and include new indicators as methodologies, technologies and data sources evolve over time. A first review was carried out in early 2018. It involved other Commission services, European agencies, Member States organisations in the European Statistical System and other stakeholders (via

the European Economic and Social Committee and the sub-group on 'Monitoring, assessing and reporting progress on the SDGs' of the Management Committee of the Multi-stakeholder platform on Sustainable Development Goals). The review led to a limited number of modifications, which have been taken into account for this 2018 edition of the EU SDG monitoring report.

The 2018 review of the indicator set also led to a list of indicators 'on hold' for possible future updates of the set. In this regard, Eurostat is working with other services of the European Commission and the EEA on the use of new data sources, such as the integration of Earth observation data and information from Copernicus, the European Earth Observation and Monitoring Programme, whenever they contribute to the increased availability, quality, timeliness and disaggregation of data ([30]). This information could, for example, improve the understanding of the imperviousness and land cover change in the EU. For additional information on the use of Copernicus data in SDG monitoring, see the brochure 'Copernicus in support of the UN Sustainable Development Goals' ([31]).

3.2 Data coverage and sources

Data in this report are mainly presented for the aggregated EU-28 level. In the cases when EU-28 aggregated data are not available, EU-27 data are presented instead, referring to the 27 EU Member States before the accession of Croatia to the EU in July 2013. In addition, whenever EU-28 data are only available for a very short time period, EU-27 data are presented in addition to the EU-28 ([32]).

In addition to the 28 EU Member States, data for EU candidate countries and the countries of the European Free Trade Association (EFTA) are included in the country-level comparisons throughout the report when available, complementing the EU-level analysis. When data availability allows, global comparisons of the EU with other large economies in the world (such as the United States, Japan and China) are also presented.

In order to reflect the 15-year scope of the 2030 Agenda, the analysis of trends is, as far as possible, based on data for the past 15 years.

For a number of indicators, in particular those based on the EU Statistics on Income and Living Conditions (EU-SILC), data are available only for shorter periods.

The data presented in this report were extracted in late August 2018. Most of the data used to compile the indicators stem from the standard Eurostat collection of statistics through the European Statistical System (ESS), but a number of other data sources have also been used, including other European Commission services, the EEA, the European Institute for Gender Equality, the OECD and the World Bank.

Eurostat's website contains a section dedicated to the EU SDG indicator set. Eurostat online data codes, such as sdg_01_10, allow easy access to the most recent data ([33]). The website also includes a section called 'Statistics Explained' ([34]), presenting the full range of statistical subjects covered by Eurostat in an easy-to-understand way. It works in a similar way to Wikipedia, offering an encyclopaedia of European statistics for everyone, complemented by a statistical glossary clarifying all terms used and numerous links to further information and the latest data and metadata.

3.2.1 Treatment of breaks in time series

Breaks in time series occur when the data collected in a specific year are not comparable with the data from previous years. This could be caused by a change in the classification used, the definition of the variable, the data coverage and/or other reasons. Breaks in time series could affect the continuity and consistency of data over time. However, it should be noted that such breaks do not undermine the reliability of the data.

In the course of preparing this monitoring report, a case-by-case assessment of breaks in times series has been conducted to determine the extent to which a break would affect the assessment of an indicator. In cases where a break was considered significant enough to affect the assessment of an indicator trend or the comparability between countries, the analysis of the indicator was adjusted accordingly.

Breaks in times series are indicated throughout the report in footnotes below the graphs.

3.3 Assessment of indicator trends

3.3.1 How are trends assessed?

This publication provides an assessment of indicator trends against SDG-related EU objectives and targets. The assessment method considers whether an indicator has moved towards or away from the sustainable development objective, as well as the speed of this movement. The method focuses on developments over time and not on the 'sustainability' ([35]) of the status.

Ideally, the trends observed for each indicator would be compared against theoretical trends necessary to reach either a quantitative target set within the political process or a scientifically established threshold. However, this approach is only possible for a limited number of indicators, where an explicit quantified and measurable target exists for the EU. In the remaining cases, a transparent and simple approach across these indicators is applied to avoid ad hoc value judgments. The two approaches are explained in more detail in section 3.3.3 (indicators with quantitative targets) and 3.3.4 (indicators without quantitative targets).

The assessment is generally based on the 'compound annual growth rate' (CAGR) formula, which assesses the pace and direction of the evolution of an indicator. This formula uses the data from the first and the last years of the analysed time span and is used to calculate the average annual rate of change of the indicator (in %) between these two data points. For a detailed description of the calculation method, see Annex III (page 348).

3.3.2 How are the assessment results presented?

The assessment of indicator trends is visualised in the form of arrows (see Table 0.1). The direction of the arrows shows whether the indicators are moving in a sustainable direction or not. This direction does not necessarily correspond to the direction in which an indicator is moving. For example, a reduction of the unemployment rate, or of greenhouse gas emissions, would be represented with an upward arrow, as reductions in these areas mean progress towards the sustainable development objectives.

Depending on whether or not there is a quantitative EU policy target, two cases are distinguished, as shown in Table 0.1. For indicators with a quantitative target, the arrows show if, based on past progress, the EU is on track to reaching the target. For indicators without a quantitative target, the arrows show whether the indicator has moved towards or away from the sustainable development objective, and the speed of this movement. The assessment method therefore differs slightly for these two types of indicators, as explained further on the next page.

Table 0.1: Assessment categories and associated symbols

Symbol	With quantitative target	Without quantitative target
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

As far as possible, indicator trends are assessed over two periods:

- The **long-term trend**, which is based on the evolution of the indicator over the past 15-year period (usually 2001 to 2016 or 2002 to 2017). The long-term trend is also calculated for shorter time series if data are available for at least 10 consecutive years.
- The **short-term trend**, which is based on the evolution of the indicator during the past five-year period (usually 2011 to 2016 or 2012 to 2017). In a few exceptional cases, the short-term trend is calculated for shorter time periods, as long as data are available for at least three consecutive years.

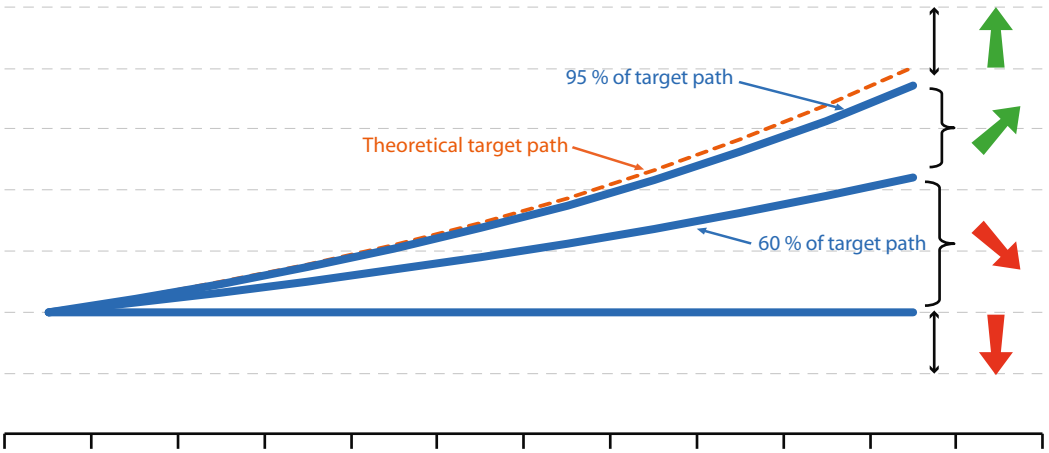
Two arrows — for the assessment of the long-term and short-term trends —- are therefore usually shown for each indicator, providing an indication of whether a trend has been persistent or has shown a turnaround at a certain point in time.

3.3.3 Indicators with quantitative targets

Whenever possible, the assessment of indicator trends takes into account concrete targets set in relevant EU policies and strategies. The main point of reference for identifying relevant policy targets is the Commission Staff Working Document (SWD) 'Key European action supporting the 2030 Agenda and the Sustainable Development Goals' accompanying the Commission Communication COM (2016) 739 'Next steps for a sustainable European future: European Union action for sustainability' from 22 November 2016.

In the presence of a quantified political target (for example, the Europe 2020 targets), the actual rate of change of the indicator (based on the CAGR as described in Annex III) is compared with the theoretical rate of change that would be required to meet the target in the target year. If the actual rate is 95 % or more of the required rate, the indicator shows a significant progress towards the EU target. Between 60 % and 95 %, the trend shows moderate progress towards the EU target, and between 0 % and 60 %, progress towards the EU target is insufficient. Ratios below 0 % mean that the trend is moving away from the EU target. Figure 0.2 shows the thresholds for assessing an indicator trend against a quantitative target that would require the indicator values to increase (as, for example, in the case of the Europe 2020 target of raising the EU employment rate to 75 %). For targets that require indicators to decline (for example, the target of reducing the EU's greenhouse gas emissions by 20 %), analogous decreasing target paths are used instead.

Figure 0.2: Thresholds for assessing indicators against a quantitative target (example of a target that requires the indicator to increase)



3.3.4 Indicators without quantitative targets

In the absence of a quantified target, it is only possible to compare the indicator trend with the desired direction. An indicator is making progress towards the SD objectives if it moves in the desired direction, and is moving away from the SD objectives if it develops in the wrong direction. The observed rate of change of the indicator, calculated based on the CAGR as described in Annex III, is then compared to the following thresholds: a change of more than 1 % per year is considered 'significant'. If this change is in the desired direction, this means 'significant progress towards SD objectives'. If the change is in the wrong direction, this means 'significant movement away from SD objectives'. A change in the desired direction between 0 % and 1 % per year is considered 'moderate progress towards SD objectives', and a change in the wrong direction between 0 % and 1 % per year is considered 'moderate movement away from SDG objectives'. See Table 0.1 for reference.

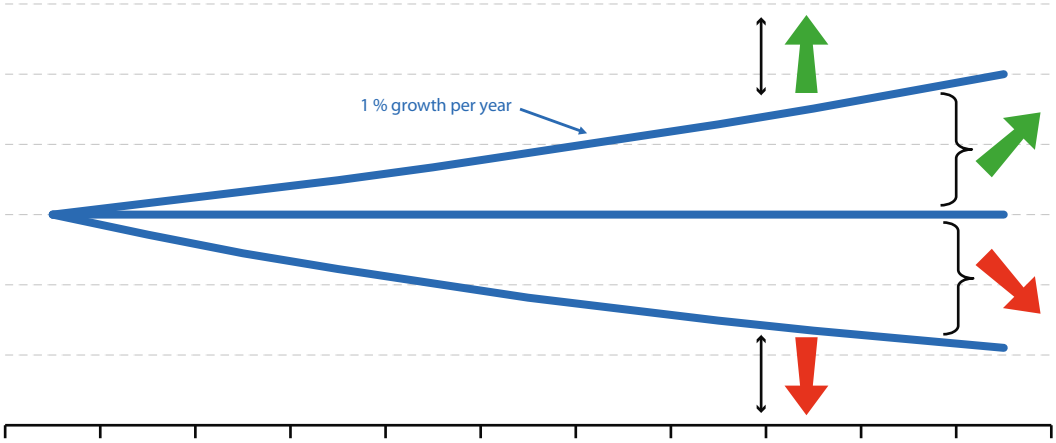
The 1 % threshold is easy to communicate, and Eurostat has used it in its monitoring reports for more than 10 years. It is discerning enough to ensure that there is a significant movement in the desired direction. Furthermore, it allows presenting a nuanced picture, with a sufficient number of indicators falling in all four categories ([36]). The threshold should not be confused with the level of EU ambition on a given topic.

Figure 0.3 shows the thresholds for assessing an indicator for which the desired direction would be an increase (for example, life expectancy at birth). For indicators where the desired direction is a decrease (such as the unemployment rate), the categories are reversed.

3.3.5 Summary of progress at goal level

In the synopsis chapter of this report, average scores of the indicators are used to rank the SDGs according to their level of progress towards the SDGs. To calculate these averages, a score is first calculated for each indicator, reflecting its short-term (past five years) assessment (see Annex III for details on the scoring method). For each goal, a simple average of the scores of the individual indicators (including the multi-purpose indicators) is then calculated. Indicators for which trends cannot be assessed (for example due to insufficient time series) are not taken into account for the average score on the goal level. The share of assessed indicators (those accompanied by an 'arrow' symbol) has to be at least 75 % to compute the summary result; below this threshold, the available indicators are considered insufficient to calculate a meaningful average score at goal level. This is currently the case for four goals (SDG 6, SDG 13, SDG 14 and SDG 16).

Figure 0.3: Thresholds for assessing indicators without quantitative targets (example of an indicator where the desired direction is an increase)



Notes

(1) Articles 3 (5) and 21 (2) of the Treaty on European Union (TEU).
(2) World Commission on Environment and Development (1987), Our Common Future.
(3) Named after the former Norwegian prime minister Gro Harlem Brundtland, who acted as chair of the WCED.
(4) United Nations General Assembly (2015), *'Resolution adopted by the General Assembly on 25 September 2015: Transforming our world: the 2030 Agenda for Sustainable Development'*, A/RES/70/1
(5) 'Conduct regular and inclusive reviews of progress at the national and sub-national levels, which are country-led and country-driven' (paragraph 79) of '*Transforming our world: the 2030 Agenda for Sustainable Development*'. The UN Department of Economic and Social Affairs (DESA) has established an online platform to compile inputs from countries participating in the national voluntary reviews of the annual session of the HLPF. See: https://sustainabledevelopment.un.org/hlpf
(6) United Nations General Assembly (2015), '*Resolution adopted by the General Assembly on 25 September 2015: Transforming our world: the 2030 Agenda for Sustainable Development.*' A/RES/70/1, paragraph 84.
(7) Information about the national sustainable development strategies of European countries can be found on the European Sustainable Development Network (ESDN) website: http://www.sd-network.eu/?k=country profiles
(8) United Nations Economic and Social Council (2016), *Progress towards the Sustainable Development Goals. Report of the Secretary-General*.
(9) United Nations (2016), *The Sustainable Development Goals Report 2016*.
(10) United Nations Economic and Social Council (2018), *Progress towards the Sustainable Development Goals. Report of the Secretary-General*; United Nations (2018), *The Sustainable Development Goals Report 2018*.
(11) The United Nations Statistical Commission, established in 1947, is the highest body of the global statistical system. It brings together the Chief Statisticians from member states from around the world. It is the highest decision making body for international statistical activities especially the setting of statistical standards, the development of concepts and methods and their implementation at the national and international level.
(12) United Nations General Assembly (2017), *'Resolution adopted by the General Assembly on 6 July 2017: Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development.'* A/RES/71/313.
(13) See: United Nations (2015), *Outcome document of the Third International Conference on Financing for Development: Addis Ababa Action Agenda*. A/CONF.227//L.1.
(14) Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.
(15) The Road map was developed by a Conference of European Statisticians Steering Group on Statistics for SDGs, coordinated by the UN ECE and to which Eurostat participates. See United Nations Economic and Social Council (2017), *Conference of European Statisticians' Road Map on Statistics for Sustainable Development Goals*, First Edition.
(16) Ibid.
(17) Göteborg European Council (2001), *Presidency conclusions, 15 and 16 June 2001*.
(18) Council of the European Union (2006), *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10917/06.
(19) European Commission (2009), *Mainstreaming sustainable development into EU policies: 2009 review of the European Union Strategy for Sustainable Development*, COM(2009) 400 final, Brussels.
(20) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth, COM (2010)2020 final*, Brussels.
(21) For more information on the Europe 2020 targets please see https://ec.europa.eu/info/strategy/european-semester/framework/europe-2020-strategy_en
(22) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739, Brussels.
(23) Eurostat (2017), *Sustainable development in the European Union — Monitoring report on progress towards the SDGs in an EU context*, Luxembourg, Publications Office of the European Union.
(24) Council of the European Union (2017), *A sustainable European future: The EU response to the 2030 Agenda for Sustainable Development*, Council conclusions (20 June 2017), Brussels.
(25) Eurostat, *Europe 2020 headline indicators*.
(26) European Commission, *10 Commission priorities*.
(27) European Commission, *Social Scoreboard, A Social Scoreboard for the European Pillar of Social Rights*.
(28) Commission Staff Working Document (2016), *Key European action supporting the 2030 Agenda and the Sustainable Development Goals*, SWD(2016) 390 final, 2016.
(29) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739, Brussels.
(30) For example, the handbook '*Satellite Earth Observations in support of the Sustainable Development Goals*' by the Committee on Earth Observation Satellites (CEOS) and the European Space Agency (ESA) was officially released at the 49th session of the UN Statistical Commission. This handbook promotes and highlights the contribution of Earth observations to the realisation of the 2030 Agenda for Sustainable Development, its goals and targets, and to the SDG Global Indicator Framework.
(31) European Commission (2018), *Copernicus in support of the UN Sustainable Development Goals*.

([32]) EU aggregates are back-calculated when sufficient information is available. For example, the EU-28 aggregate is often presented for periods prior to the accession of Croatia in 2014 and the accession of Bulgaria and Romania in 2007, as if all 28 Member States had always been members of the EU. The label is changed if the data refer to another aggregate (EU-27 or EU-25) or a note is added if the data refer to a partial aggregate created from an incomplete set of country information (no data for certain Member States or reference years).

([33]) In this report, online data codes are given as part of the source below each table and figure. When clicking on the online data code, the reader is directly led to the indicator table showing the most recent data. Alternatively, the data can be accessed by entering the data code in the search field on the Eurostat website. The indicator table also contains a link to the source dataset, which generally presents more dimensions and longer time series than the indicator table. The complete set of indicators is presented in Annex II of this publication.

([34]) Eurostat, *Statistics explained*.

([35]) The concept of sustainable development should be distinguished from that of sustainability. 'Sustainability' is a property of a system, whereby it is maintained in a particular state through time. The concept of sustainable development refers to a process involving change or development. The strategy aims to 'achieve continuous improvement of quality of life', and the focus is therefore on sustaining the process of improving human well-being. Rather than seeking a stable equilibrium, sustainable development is a dynamic concept, recognising that changes are inherent to human societies.

([36]) Higher thresholds (for example 2 %) have been tested and finally rejected, since they make the overall picture less interesting, as a vast majority of indicators would fall in the two 'moderate' categories.

1 End poverty in all its forms everywhere

Goal 1 calls for the eradication of poverty in all its manifestations. It envisions shared prosperity, basic standard of living and social protection benefits for people everywhere, including the poorest and most vulnerable. The goal seeks to ensure equal rights and access to economic and natural resources.

eurostat supports the SDGs

Poverty can harm people's lives and limit their opportunities to achieve their full potential. It is usually associated with poor health, low salaries, unemployment and low educational outcomes. Poverty is a multidimensional phenomenon and has a tendency to persist over time and to be transmitted among generations, meaning that children born into poverty bear a higher risk of poverty in adult life than the average population ([1]). Coordinated policy interventions – such as effective redistribution, education, health, social protection and employment systems – can prevent long-term losses of economic productivity from whole groups of society and encourage inclusive and sustainable growth ([2]). Poverty can take on various forms, including, but not limited to, income poverty, material deprivation and working poverty. Meeting the basic needs of its citizens and eradicating all forms of poverty has been a priority of the EU, which is also reflected in the Europe 2020 strategy. The EU's goal is to lift at least 20 million people out of the risk of poverty and social exclusion by 2020 compared to the year 2008 ([3]).

Table 1.1: Indicators measuring progress towards SDG 1, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Multidimensional poverty			
People at risk of poverty or social exclusion	↘ (1)	↘ (2)	page 37
People at risk of income poverty after social transfers	↘ (1)	↘	page 40
Severely materially deprived people	↑ (1)	↑	page 41
People living in households with very low work intensity	↗ (1)	↗	page 42
In work at-risk-of-poverty rate	↓ (1)	↓	page 43
Basic needs			
Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor	:	↗	page 44
Self-reported unmet need for medical care (*)	:	↑	SDG 3, page 78
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household (*)	↑ (1)	↑	SDG 6, page 122
Population unable to keep home adequately warm (*)	↑ (3)	↑	SDG 7, page 147
Overcrowding rate (*)	↑ (1)	↗	SDG 11, page 208

(*) Multi-purpose indicator.
(1) Past 11-year period, trend refers to EU-27.
(2) Trend refers to EU-27.
(3) Past 10-year period, trend refers to EU-27.

Table 1.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

No poverty in the EU: overview and key trends

Monitoring SDG 1 in an EU context involves tracking aspects related to multidimensional poverty and basic needs. While the EU has achieved some progress on meeting the basic needs of its citizens over the past few years, it made only moderate progress on ending the different forms of poverty, as shown in Table 1.1.

Multidimensional poverty

SDG 1 calls for the eradication of extreme poverty, which the UN defines as the share of people living on less than USD 1.90 a day. While this definition is less relevant in the EU context, SDG 1 also calls for poverty in all its dimensions to be halved by 2030. This universal approach to reducing poverty is directly relevant for the EU, as it already employs a multidimensional measure of poverty in its Europe 2020 strategy where the aim is to 'lift at least 20 million people out of the risk of poverty or social exclusion' by 2020 compared with the year 2008. The headline indicator on poverty within the Europe 2020 strategy is based on three sub-concepts: income poverty, low work intensity and material deprivation. By using this multidimensional approach, the indicator highlights other issues in addition to relatively low income that can also put people at a disadvantage to the rest of society. It also underlines that these issues are closely interlinked. Combined, they reflect the extent to which parts of the population are at risk of exclusion and marginalisation from economic, social and cultural activities.

118.0
million people in the EU were at risk of poverty or social exclusion in 2016

Despite recent improvements, the EU is not yet on track to reach its poverty target by 2020

In 2016, 118.0 million people, or 23.5 % of the EU population, were at risk of poverty or social exclusion. This means nearly one in four people in the EU experienced at least one of the following three forms of poverty: income poverty, severe material deprivation, or very low work intensity. Compared to 2005, the share of people affected has declined, but not steadily, while cross-country differences persist ([4]). The development of the risk of poverty or social exclusion in the EU over the past decade has been marked by two turning points: in 2009, after which the number of people at risk started to rise because of the delayed social effects of the economic crisis ([5]) and in 2012, when this upward trend reversed. By 2016, the number of people affected had fallen almost to 2008 levels. However, this recent improvement has not been enough for the EU to advance significantly towards the Europe 2020 strategy's target, which would mean that no more than 96.1 million people in the EU are at risk of poverty or social exclusion by 2020 ([6]).

86.9
million people in the EU were affected by income poverty in 2016

Income poverty was the most widespread form of poverty in the EU in 2016

The three aspects of poverty covered by the multidimensional poverty indicator tend to overlap and some people are affected by two or even all three forms of poverty. At 86.9 million or 17.3 % of EU citizens, income poverty was the most prevalent form of poverty in the EU in 2016. This means that after social transfers these people had an equivalised disposable income of less than 60 % of the national median. The second most frequent form of poverty was very low work intensity, affecting 39.1 million people or 10.5 % of the EU population aged 18 to 59 ([7]). At the same time, 7.5 % of the EU population, or 37.8 million people, were affected

37.8
million people were affected by severe material deprivation in the EU in 2016

by severe material deprivation, meaning they were unable to afford four or more items out of a list of nine considered by most people to be desirable or even necessary for an adequate life (see page 41 for the full list of items).

The European Commission, the European Council and the European Parliament have jointly proclaimed a European Pillar of Social Rights ([8]) to enable upwards convergence with regards to social and labour market performances, thereby contributing to reducing poverty and inequalities.

The three aspects of poverty followed different trends between 2005 and 2016. While income poverty has increased gradually since 2005 (from 16.5 % to 17.3 % in 2016), the number of people affected by very low work intensity was similar in 2005 and 2016. Since 2012, there has been a sharp decline in severe material deprivation, from 9.9 % of the EU population in 2012 to 7.5 % in 2016. Such diverging trends among the three sub-indicators can arise because of their different nature and the three related but distinct concepts of poverty they represent. Income poverty is a relative measure and reflects whether someone's standard of living and income is much lower than that of the entire society he or she lives in. In other words, the at-risk rate depends on the income level enjoyed by most people in a country or region. This means that even in times of increasing average or median income, the relative poverty rate could remain stable. Severe material deprivation measures poverty from a different angle and indicates a lack of resources to cover certain material needs. It is likely to decrease during economic recoveries when people are generally financially better off.

39.1

million people in the EU were living in households with very low work intensity in 2016

Over 37 million people, or nearly a third (31.7 %) of all people at risk of poverty or social exclusion, were affected by more than one dimension of poverty in 2016. Out of these, 8.4 million people, or one in 14 of those at risk of poverty or social exclusion (7.1 %), were affected by all three forms ([9]). Over time, the percentage of the EU population affected by all three forms of poverty has increased slightly: by 0.3 percentage points between 2008 and 2016. Simultaneously, the share of those affected by only one dimension of poverty decreased slightly from 16.5 % in 2008 to 15.8 % in 2016. Thus, despite the favourable decrease in the overall share of people at risk of poverty or social exclusion, the depth of hardship for those affected has increased slightly.

Considerable differences in the share of poverty within the EU but also across the world

The aggregated EU figure for the risk of poverty and social exclusion masks considerable differences between Member States, whose national risk of poverty and social exclusion rates ranged from 13.3 % to 40.4 % in 2016. Among the three sub-indicators, the largest differences within the EU were observed for severe material deprivation, which is practically non-existent in some Member States and affects around a third of the population in others. Income poverty varies considerably less across Member States, ranging between 9.7 % and 25.3 %. The third sub-indicator, the share of people under 60 living in households with very low work intensity, varied the least across the EU, from 5.8 % to 18.2 %.

Overall, the share of EU citizens living in income poverty (17.3 % in 2016) is relatively low when compared to other main economies worldwide. In most non-EU OECD countries, this value was roughly between 20 % and 25 % ([10]). Commonwealth countries in the OECD outside the EU (Australia, Canada and New Zealand), as well as Asian OECD countries and Russia were at the bottom end of this range, while income poverty was more prevalent in the Latin American OECD countries as well as Israel and the United States.

The implementation of the European Pillar of Social Rights ([11]) will be monitored by the Social Scoreboard in the context of the European Semester. The country-specific recommendations aim to encourage fiscal and structural reforms (including social policies) to reduce both poverty and inequality ([12]).

To reduce poverty, governments provide a range of social transfers, such as unemployment benefits, sickness and invalidity benefits and minimum income benefits. The impact of these transfers can be assessed by comparing the at-risk-of-poverty rate before and after social transfers. In the EU, social transfers reduced the share of people at risk of poverty by 8.6 percentage points in 2016, from 25.9 % ([13]) to 17.3 %. However, the extent to which Member States were able to reduce their national at-risk-of-poverty rate through social transfers varied greatly, between 4.0 and 18.1 percentage points.

Single households, migrants and people with lower education face high risks of poverty or social exclusion

The overall rate of people at risk of poverty or social exclusion masks considerable differences between different groups of people. For instance, around two-thirds of children of parents with at most lower secondary education were at risk in 2016. Similarly, almost half of households with only one adult and one or more dependent children were at risk of poverty or social exclusion, while households with two adults faced a risk below the EU average. EU citizens born outside the EU also faced a much higher risk than locally born people.

Identifying especially vulnerable groups is an important key to creating sound policies to fight poverty. Several factors have an influence on poverty rates:

Differences by sex: In 2016, women were more likely to be at risk of poverty or social exclusion than men (the rate for women was 24.4 %, while for men it was 22.5 %). Because women are more likely to experience the long-term effects of reduced labour market participation than men, the gender poverty gap — the difference in the risk of poverty rate between men and women — is highest in the oldest age group (65 or over). Between 2008 and 2016, the overall gender poverty gap narrowed slightly. This reduction took place between 2012 and 2015 but the trend started to reverse again in the most recent year considered. The risk for women was also higher in all three sub-indicators.

Differences by age group: Young people aged 18 to 24 were the age group most at risk of poverty or social exclusion — almost a third were at risk in 2016 (30.6 %). This pattern was also present in all three sub-indicators. Moreover, compared to 2010, this group also experienced the greatest increase in the risk of poverty rate (by 1.2 percentage points), even though their situation showed some improvement between 2015 and 2016. In contrast, older people aged 65 or over had the lowest risk of poverty or social exclusion, at 18.2 % in 2016 ([14]).

The Youth Guarantee Programme ([15]) was set up to tackle youth unemployment. Its specific actions aim to reduce poverty and social exclusion among young people.

Differences by household type: Single people with one or more dependent children had a 48.0 % likelihood of being at risk of poverty or social exclusion in 2016. This was just over twice the average rate and higher than for any other household type. However, this group experienced the largest decline in the percentage at risk since 2010, when the rate was at 52.2 %. In general, households with only one adult — both with children and without — and households with three or more children are at an increased risk of poverty or social exclusion. In single-adult households, there is limited support to cushion temporary disruptions such as unemployment or sickness. Single parents also face the challenge of being both the primary breadwinner and caregiver for the family. Both of these roles are time-consuming and often not easily compatible,

especially when affordable and high-quality child care is not available to the family.

Differences by educational level: In 2016, 34.8 % of people with at most lower secondary educational attainment were at risk of poverty or social exclusion, a rate around three times higher than for people with tertiary education (11.7 %). An increased risk for people with this educational background is also evident in all three sub-indicators. Moreover, with an at-risk of poverty or social exclusion rate of 63.7 %, children of parents with at most pre-primary or lower secondary education faced an especially grim situation. Their risk of poverty rate was almost six times higher than for children of parents with first- or second-stage tertiary education.

Differences by disability status: In 2016, people with disabilities were at a higher risk of poverty or social exclusion (around 30 %) than those without (around 20 %) ([16]).

Differences by degree of urbanisation: On average, EU citizens in rural areas were slightly more likely to live at risk of poverty or social exclusion than those in urban areas (25.5 % in rural areas compared with 23.6 % in urban areas) in 2016. Despite these overall results, in most northern, central and western Member States, the pattern was reversed, with people residing in urban areas more likely to be affected. Furthermore, while income poverty and severe material deprivation were more prevalent in rural areas in 2016, people living in households with very low work intensity were more often found in urban areas than in rural ones.

Differences by country of birth: In 2016, people living in the EU but born in a non-EU country had a 39.2 % risk of living in poverty or social exclusion. The rate was lower for people born in an EU country other than the one they were living in, at 24.5 %. Among people whose country of residence corresponded to their country of birth, 21.6 % were at risk of poverty or social exclusion. Thus, people born outside the EU were almost twice as likely to be at risk of poverty or social exclusion compared to those born in the reporting country. Compared to migration from a country located outside the EU, migration within the EU bears a far smaller risk of poverty or social exclusion.

Having a job is not a guarantee against poverty or social exclusion

Of all the different groups based on employment status in the EU, unemployed people are the most at risk of poverty or social exclusion, with about two-thirds at risk overall and 48.6 % at risk of income poverty in 2016. However, poverty or social exclusion can also affect employed people. After remaining relatively stable between 2005 and 2010, the share of people unable to escape the risk of poverty despite being employed, the so-called working poor, has increased over the past six years, from 8.3 % in 2010 to 9.6 % in 2016.

9.6 %
of employed people in the EU were at risk of income poverty in 2016

The share of working poor varies across different groups of society. In general, the groups identified as more susceptible to poverty or social exclusion are also the groups more often affected by in-work poverty or social exclusion. Thus, compared to the 9.6 % of employed people who were at risk of poverty in 2016, the share was considerably larger among households headed by only one adult with dependent children (21.6 %) ([17]), people born outside the EU (at 20.8 %) ([18]) and people with at most pre-primary or lower secondary education (19.3 %) ([19]). Interestingly, except for those aged between 18 and 24, men were more often among the working poor than women, although these differences were smaller than between the other sub-groups mentioned. This is because women are more often secondary earners in their families, meaning the household income does not depend solely on them ([20]).

The extent to which someone is affected by in-work poverty strongly depends on the terms and conditions of their employment. Employees working under a temporary contract were around three times more likely to live in poverty or

social exclusion than people with a permanent position (risk of 16.2 % instead of 5.8 %) in 2016 ([21]). Intuitively, whether people are employed full- or part-time also influences the risk of poverty or social exclusion despite employment. At 15.8 %, people employed part-time were twice as likely to be at risk of poverty or social exclusion as people working full-time, whose risk was at 7.8 % in 2016 ([22]).

The European Social Fund (ESF) ([23]) is Europe's main tool for promoting employment and social inclusion – helping people to get access to training, a job (or a better job), integrating disadvantaged people into society and ensuring fairer life opportunities for all.

Basic needs

Being at risk of poverty can have a severe impact on a person's ability to meet their basic needs such as being able to afford adequate housing, keeping their home adequately warm or receiving medical treatment when needed.

Adequate housing is unavailable to around a sixth of the EU population

An adequate living situation, defined by the United Nations as a safe and secure home and community in which to live in peace and dignity ([24]), is necessary for active inclusion in society. For example, in many cases an address is a precondition to getting a job. In addition, the costs of housing determine what is left of household budgets for other expenses, such as for education and culture, or even food. Furthermore, the local neighbourhood is particularly relevant because of social networks and the services available within one's vicinity ([25]). At the same time, people suffering from poverty are far more often restricted to sub-optimal housing than the overall population.

15.4 %
of the EU population lived in poor dwelling conditions in 2016

Inadequate housing — housing that is marked by a leaking roof; damp walls, floors or foundation; or rot in window frames or floors — affected 15.4 % of the EU population in 2016. This was 0.2 percentage points less than in 2011, but constitutes an increase compared to 2015. Among people living in income poverty, almost a quarter were affected by a dire housing situation. Regarding basic sanitary facilities, living conditions in European countries have improved. In 2016, 1.9 % of the overall EU population lived in a house or apartment equipped neither with a bath, nor with a shower, nor with an indoor flushing toilet. The situation has improved by 0.5 percentage points since 2011. Nevertheless, 5.8 % of people living below the income poverty threshold were still exposed to these housing deficiencies in 2016.

1.9 %
of the EU population lacked sanitary facilities at home in 2016

The Fund for European Aid to the Most Deprived (FEAD) supports EU countries' actions in providing food, clothing and other essential goods as well as non-material social inclusion measures to the poorest in society.

Another important aspect when considering adequate housing is the ability to keep one's home warm. At a rate of 21.0 %, people afflicted by income poverty were far more often unable to keep their home adequately warm in 2016, while this rate was at 8.7 % among the overall population. The ability to keep one's home warm has increased among the overall population since 2011. However, it has remained more

8.7 %
of the EU population were unable to keep their home adequately warm in 2016

or less constant among people faced by income poverty.

Furthermore, many EU citizens also share a dwelling with more people than there is space for and thus face overcrowding ([26]) within their household. Such living conditions can significantly affect quality of life by restricting opportunities for movement, rest, sleep, privacy and hygiene. In 2016, 16.6 % of the EU population lived in an overcrowded household. At 29.5 %, the incidence of overcrowding was almost twice as high for people with an income below the poverty threshold.

16.6 %
of the EU population lived in an overcrowded household in 2016

One of the most extreme consequences of poverty and social exclusion is homelessness. However, so far, there are few official statistics on homelessness, and those that exist are rarely comparable between countries ([27]). The OECD nonetheless estimated the number of homeless people as a share of the population for some selected countries. Among EU Member States where data was available (22 countries, excluding Belgium, Bulgaria, Cyprus, Malta, Romania and Slovakia), the estimated share of homeless people ranged from 0.01 % of the population (Croatia) to 0.65 % (Czech Republic), with the share below 0.25 % in most cases. These estimates refer to the period 2006 to 2015.

People who self-report unmet needs for medical care most commonly cite costs as the reason

As with access to adequate housing, access to health care services may help break the spiral of poor health that contributes to, and results from, poverty and exclusion. In turn, this may contribute to increased productivity, improved quality of life and reduced costs associated with social protection systems.

Barriers to accessing health services include the costs, distance and waiting time. In 2016, 2.5 % of the EU population aged 16 and above reported unmet needs for medical care, a distinct improvement of 0.9 percentage points compared to 2011. Cost was the main reason given for impeded access to health care services, indicated by 1.6 % of the EU population. Again, the overall average masks considerable differences between income groups. While only 1.1 % of the richest 20 % of the population reported unmet care needs, this was the case for 5.0 % of people in the poorest population quintile ([28]).

2.5 %
of the EU population reported unmet needs for medical care in 2016

Presentation of the main indicators

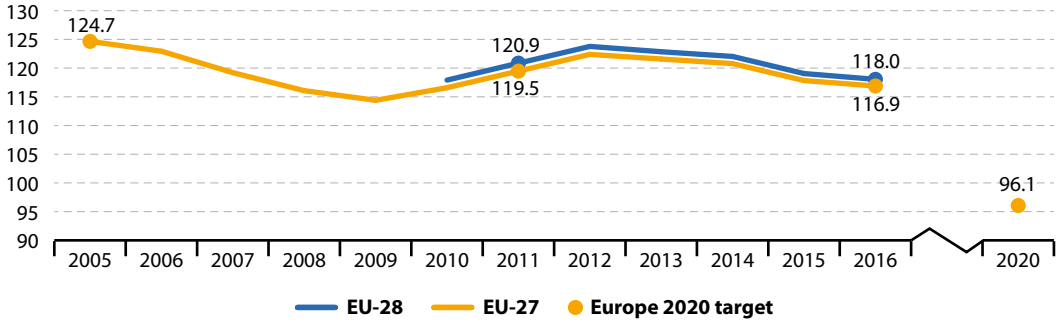
People at risk of poverty or social exclusion

LONG TERM 2005–2016

SHORT TERM 2011–2016

While a household's income is a key determinant of its standard of living, other aspects can prevent people from full participation in society such as an impeded access to labour markets or material deprivation. To reflect these different dimensions of poverty, the broad indicator 'at risk of poverty or social exclusion' shows the number of people affected by at least one of the following three forms of poverty: income poverty, severe material deprivation and very low work intensity (see pages 40 to 42 for a detailed description on these sub-indicators). Data on the three sub-indicators are derived from the EU Statistics on Income and Living Conditions (EU-SILC).

Figure 1.1: People at risk of poverty or social exclusion, EU-27 and EU-28, 2005–2016 (million people)

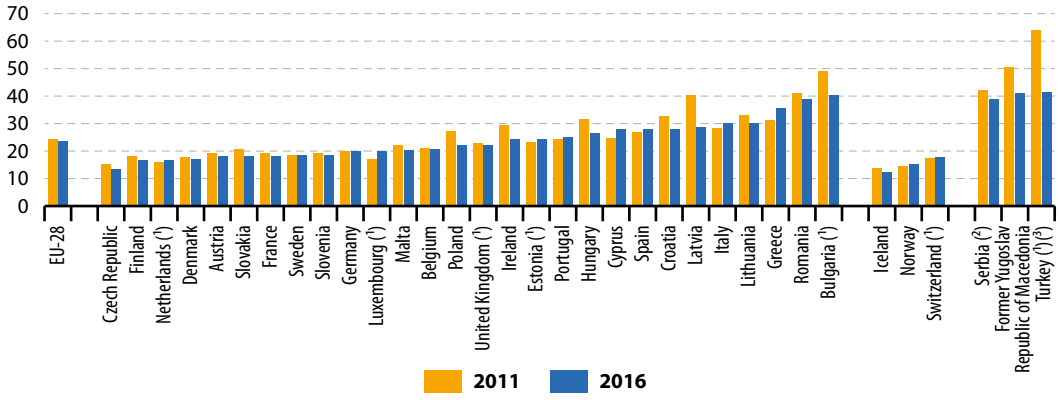


Note: Data for 2005 and 2006 are estimates.

Source: Eurostat (online data code: sdg_01_10)

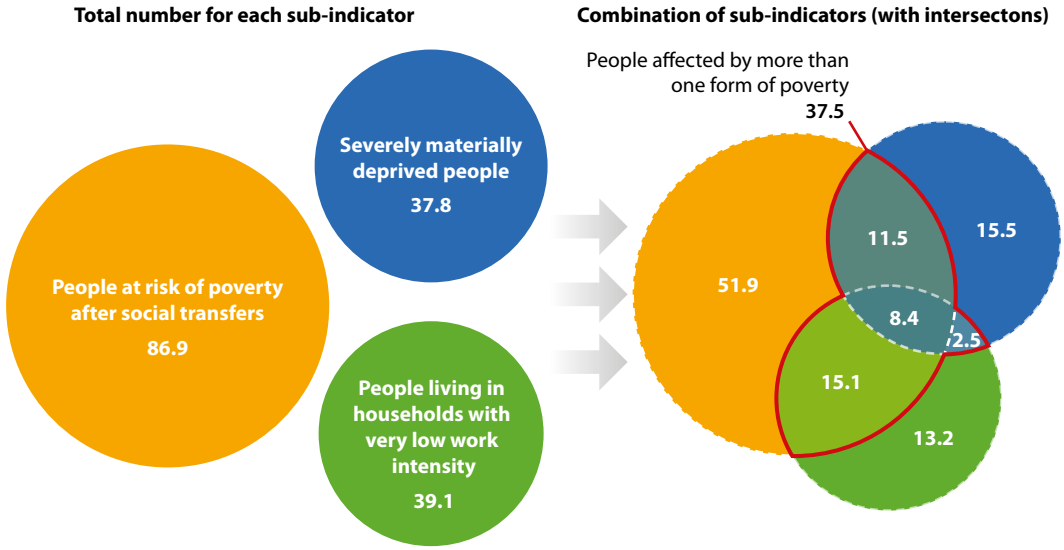
Figure 1.1 shows that the number of people at risk of poverty or social exclusion in the EU was lower in 2016 than in 2005. On average, this amount fell by 0.6 % per year in the EU-27 during this period. Slightly less pronounced improvements were achieved in the short term between 2011 and 2016, when this share decreased by an average of 0.4 % per year in the EU-27. Despite the overall improvement in the number of people at risk of poverty or social exclusion over the past decade, the target of lifting at least 20 million people out of the risk of poverty or social exclusion by the year 2020 compared to the year 2008 remains far from being met. To achieve this goal, an average annual decrease of 4.8 % would be required between 2016 and 2020.

Figure 1.2: People at risk of poverty or social exclusion, by country, 2011 and 2016
(% of population)



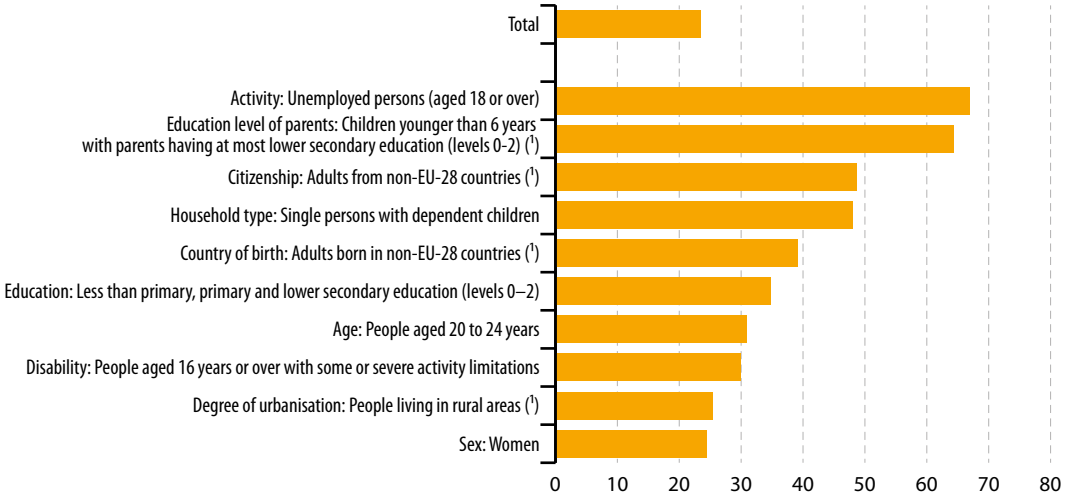
(1) Break(s) in time series between 2011 and 2016. (2) 2013 data (instead of 2011). (3) 2015 data (instead of 2016).
Source: Eurostat (online data code: sdg_01_10)

Figure 1.3: Aggregation of sub-indicators of 'People at risk of poverty or social exclusion', EU-28, 2016
(million people)



Source: Eurostat (online data code: ilc_pees01)

Figure 1.4: People most at risk of poverty or social exclusion, by sub-group, EU-28, 2016
(% of population)



(1) Estimated data.

Source: Eurostat (online data code: ilc_peps01, ilc_peps02, ilc_peps03, ilc_peps04, ilc_peps06, ilc_peps13, ilc_peps60, hlth_dpe010)

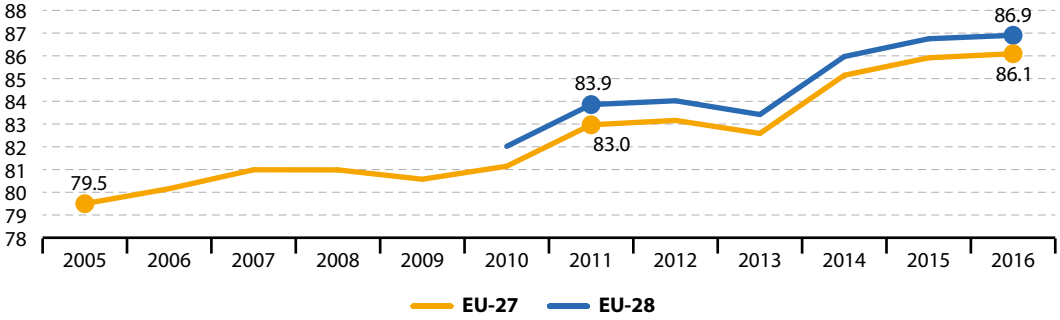
LONG TERM 2005–2016

SHORT TERM 2011–2016

People at risk of income poverty after social transfers

This indicator measures the number of people with an equivalised disposable income below the risk-of-poverty threshold. This is set at 60 % of the national median equivalised ([29]) disposable income after social transfers. The data stem from the EU Statistics on Income and Living Conditions (EU-SILC).

Figure 1.5: People at risk of income poverty after social transfers, EU-27 and EU-28, 2005–2016 (million people)

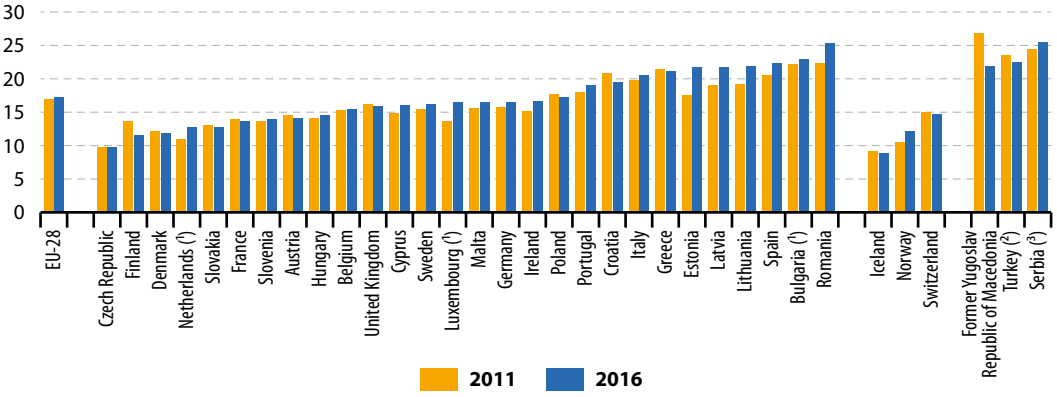


Note: 2005 and 2006 data are estimates.

Source: Eurostat (online data code: sdg_01_20)

Figure 1.5 shows that income poverty has been spreading across the EU over the past decade. Both in the long term (since 2005) and the short term (since 2011) the number of people at risk of income poverty in the EU-27 after social transfers has increased gradually at an average annual rate of 0.7 %.

Figure 1.6: People at risk of income poverty after social transfers, by country, 2011 and 2016 (% of population)



(1) Break(s) in time series between 2011 and 2016. (2) 2015 data (instead of 2016). (3) 2013 data (instead of 2011).

Source: Eurostat (online data code: sdg_01_20)

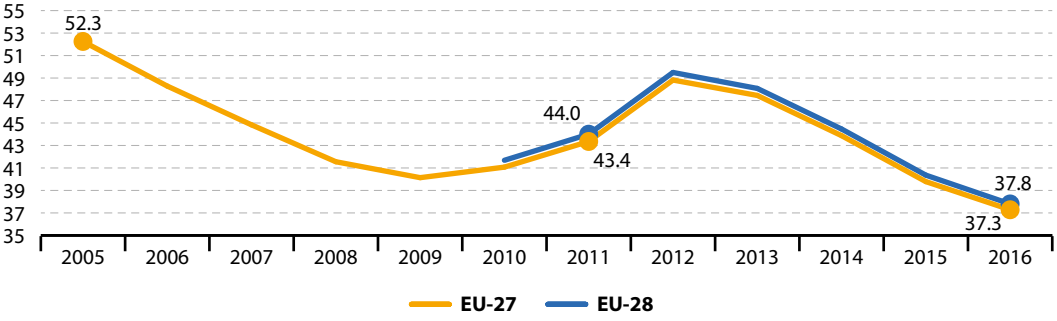
Severely materially deprived people

LONG TERM 2005–2016

SHORT TERM 2011–2016

This indicator covers issues relating to economic strain, durables, housing and the environment of dwellings. Severely materially deprived people have living conditions greatly constrained by a lack of resources, which means they cannot afford at least four of the following items: to pay their rent or utility bills, to keep their home warm, to pay unexpected expenses, to eat meat, fish or other protein-rich nutrition every second day, a week holiday away from home, a car, a washing machine, a colour TV or a telephone. Data for this indicator stem from the EU Statistics on Income and Living Conditions (EU-SILC).

Figure 1.7: Severely materially deprived people, EU-27 and EU-28, 2005–2016
(million people)

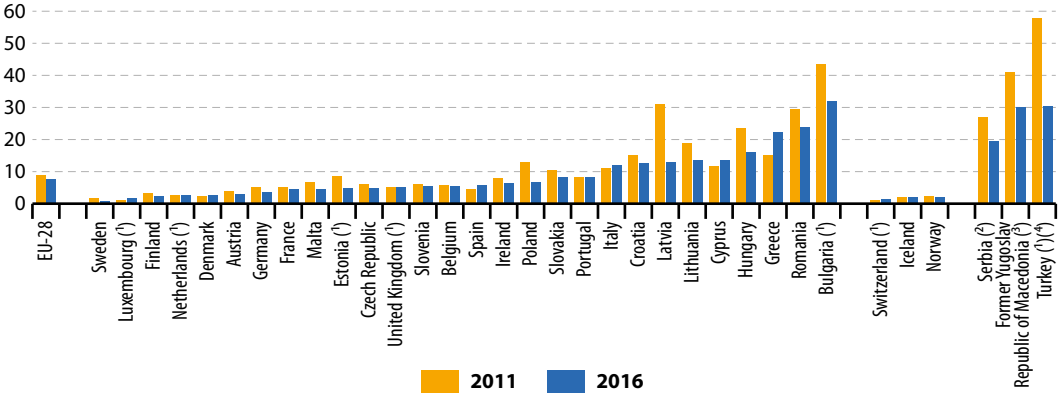


Note: 2005, 2006 and 2009 data are estimates.

Source: Eurostat (online data code: sdg_01_30)

Despite a temporarily increase in the number of people living in severe material deprivation between 2009 and 2012, there has been an overall favourable development, as shown in Figure 1.7. Over both the long and short terms, this number decreased by 3.0 % per year on average in the EU-27.

Figure 1.8: Severely materially deprived people, by country, 2011 and 2016
(% of population)



(1) Break(s) in time series between 2011 and 2016.
(2) 2013 data (instead of 2011).
(3) 2012 data (instead of 2011).
(4) 2015 data (instead of 2016).

Source: Eurostat (online data code: sdg_01_30)

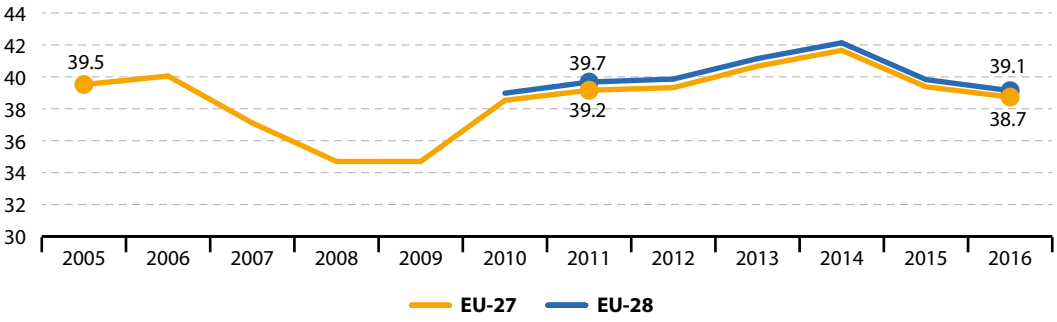
LONG TERM 2005–2016

SHORT TERM 2011–2016

People living in households with very low work intensity

This indicator describes the number of people aged 0 to 59 living in households where the adults worked less than 20 % of their work potential during the past year. The EU Statistics on Income and Living Conditions (EU-SILC) are the data source for this indicator.

Figure 1.9: People living in households with very low work intensity, EU-27 and EU-28, 2005–2016
(million people aged 0 to 59)

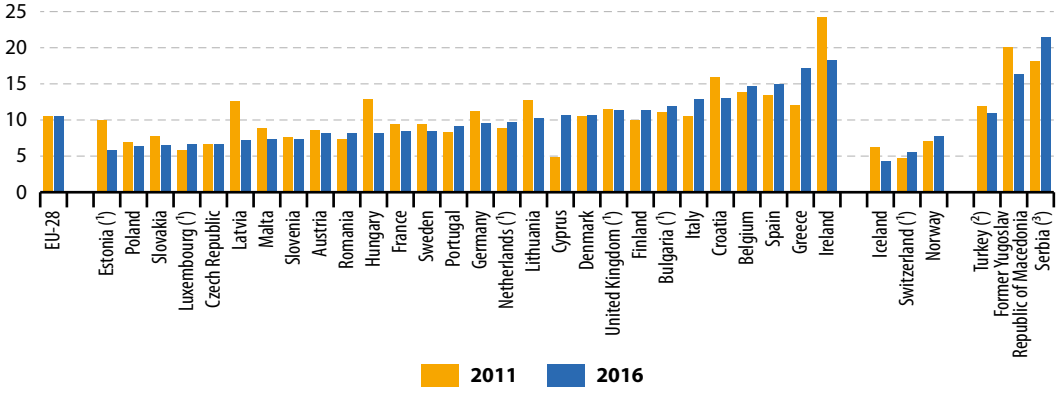


Note: 2005 and 2006 data are estimates.

Source: Eurostat (online data code: sdg_01_40)

In 2016, the number of people living in households with very low work intensity was slightly below the number observed both in 2005 and in 2011. This means there was an average annual fall of 0.2 % in the EU-27 over both the short and long terms. In between, however, this number showed some fluctuation. Primarily, the onset of the economic crisis and the subsequent recovery had an influence on this development.

Figure 1.10: People living in households with very low work intensity, by country, 2011 and 2016
(% of population aged 0 to 59)



(1) Break(s) in time series between 2011 and 2016.
(2) 2015 data (instead of 2016).
(3) 2013 data (instead of 2011).

Source: Eurostat (online data code: sdg_01_40)

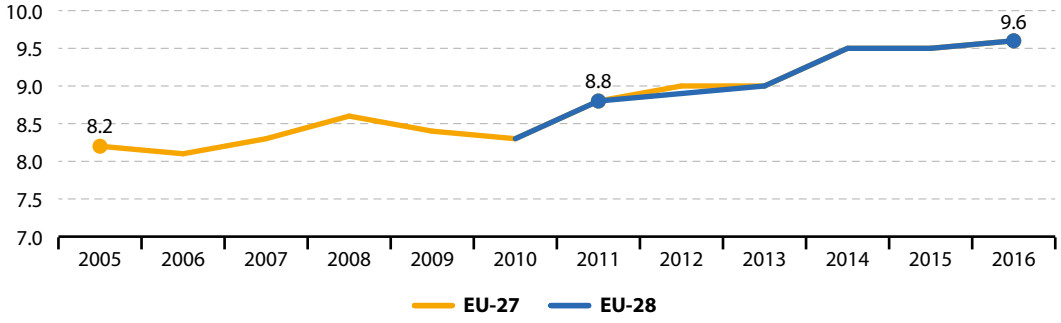
In work at-risk-of-poverty rate

LONG TERM 2005–2016

SHORT TERM 2011–2016

This indicator refers to the share of employed people aged 18 years or over at risk of income poverty (see the definition on page 40). People are considered 'employed' if they held a job for more than half of the reference year. Data for this indicator are taken from the EU Statistics on Income and Living Conditions (EU-SILC).

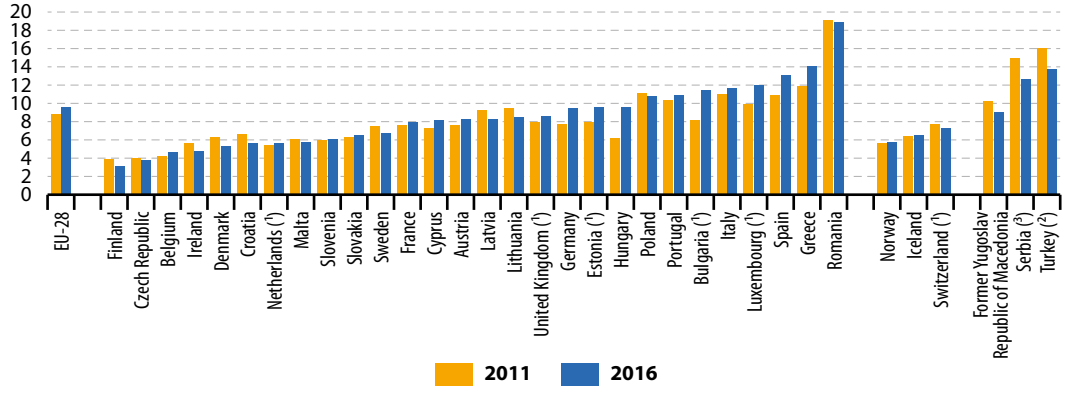
Figure 1.11: In-work at-risk-of-poverty rate, EU-27 and EU-28, 2005–2016
(% of population aged 18 or over)



Source: Eurostat (online data code: sdg_01_41)

Although there has been a slightly favourable development in the amount of people living in households with very low work intensity (see Figure 1.9), being in work has become less of an insurance against poverty. Over the past decade, the share of so-called working poor has increased with an average of 1.4 % annually in the EU-27. The development is more dire when only considering the short-term trend since 2011, with an average annual growth rate of 1.8 %.

Figure 1.12: In-work at-risk-of-poverty rate, by country, 2011 and 2016
(% of population aged 18 or over)



(1) Break(s) in time series between 2011 and 2016.
(2) 2013 data (instead of 2011).
(3) 2015 data (instead of 2016).

Source: Eurostat (online data code: sdg_01_41)

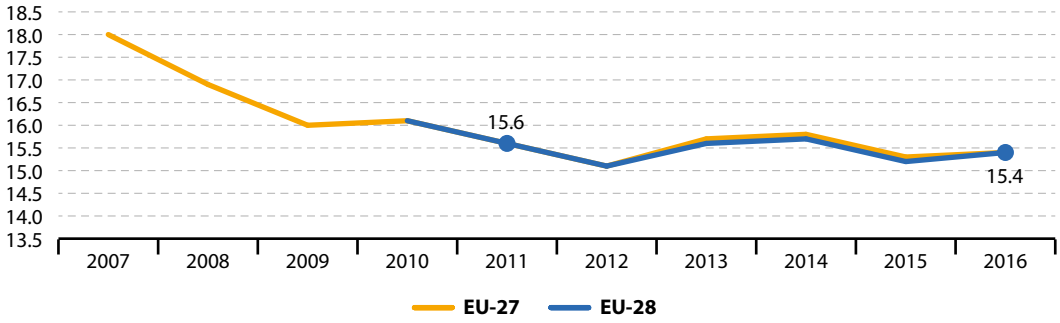
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2011–2016

Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor

The indicator reflects the share of the population with at least one of the following deficits in their home: a leaking roof, damp walls, floors or foundation, or rot in window frames or floor. This indicator is derived from the EU Statistics on Income and Living Conditions (EU-SILC).

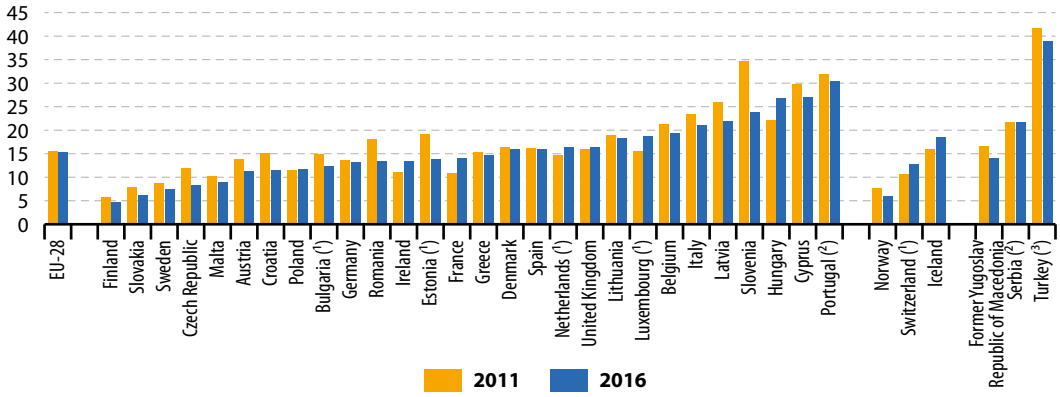
Figure 1.13: Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor, EU-27 and EU-28, 2007–2016
(% of population)



Source: Eurostat (online data code: (online data code: sdg_01_60)

Between 2007 and 2016, considerable progress was made in reducing the share of people burdened by inadequate housing. However, most of this progress occurred between 2007 and 2012. Even so, in the short term between 2011 and 2016 the rate still fell by an average of 0.3 % per year in the EU-28.

Figure 1.14: Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor, by country, 2011 and 2016
(% of population)



(1) Break(s) in time series between 2011 and 2016.
(2) 2013 data (instead of 2011).
(3) 2015 data (instead of 2016).

Source: Eurostat (online data code: (online data code: sdg_01_60)

Further reading on poverty

European Commission (2017), *Employment and Social Developments in Europe, Annual Reviews 2017*, Luxembourg, Publications Office of the European Union.

European Commission (2018), *Employment and Social Developments in Europe, Annual Reviews 2018*, Luxembourg, Publications Office of the European Union.

European Commission (2018), *Joint Employment Report 2018*, Brussels, Directorate-General for Employment, Social Affairs and Inclusion.

European Commission (2017), *European Semester Thematic Factsheet*, Social Inclusion.

European Union (2017), *Social Protection Committee Annual Report 2017*, Luxembourg, Publications Office of the European Union.

European Union (2017), *Monitoring social inclusion in Europe*, 2017 edition, Luxembourg, Publications Office of the European Union.

United Nation (2018), *The Sustainable Development Goals Report*, New York, United Nations Publications.

Further data sources on poverty

OECD, Income Distribution Database (IDD): Gini, poverty, income, methods and concepts.

OECD, Affordable Housing Database.

The World Bank, Poverty and Equity Data Portal.

Notes

(1) For more information see: Eurostat (2013), *Statistics Explained, Intergenerational transmission of disadvantage statistics*.
(2) European Commission (2013), *Social trends and dynamics of poverty*, ESDE conference, Brussels.
(3) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
(4) Data refer to EU-27 (from 2005 to 2009) and EU-28 (from 2010 onwards).
(5) For the development following 2009, see European Commission's Directorate General for Economic and Financial Affairs (2014), *Poverty developments in the EU after the crisis: a look at main drivers*, ECFIN Economic Brief.
(6) Due to the structure of the survey on which most of the key social data is based (EU Statistics on Income and Living Conditions), a large part of the main social indicators available in 2010, when the Europe 2020 strategy was adopted, referred to 2008 as the most recent year of data available. This is why 2008 data for the EU-27 are used as the baseline year for monitoring progress towards the Europe 2020 strategy›s poverty target. For the same reason, the country breakdowns in this chapter use the year 2008 for comparison. Since 116.1 million people were at risk of poverty or social exclusion in the EU-27 in 2008, the target value to be reached is 96.1 million by 2020.
(7) The dimension 'very low work intensity' is only measured among those aged 0–59. Therefore, people over the age of 59 are considered at risk of poverty or social exclusion only if the criteria of one of the two dimensions 'income poverty' or 'severe material deprivation' are met.
(8) European Commission (2017), *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels.
(9) The year of reference differs for the three sub-indicators. The risk of poverty after social transfers and whether or not someone lives in a household with very low work intensity are based on data from the previous year. The extent to which an individual is severely materially deprived is determined based on information from the year of the survey.
(10) These values are taken from the OECD dataset on Income Distribution and Poverty and correspond to the newest data available in this set (2016: the USA and Israel, 2015: Chile, Korea, Canada and Turkey, 2014: New Zealand, Australia and Mexico, 2013: Brazil, 2012: Japan, 2011: Russia). All data are based on the OECD's new income definition, which includes the value of goods produced for own consumption as a component of self-employed income, an element not considered in the SILC income definition.
(11) European Commission (2017), *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels.
(12) For more information see: European Commission (2017), *Council Recommendation on the economic policy of the euro area*, SWD(2017) 660 final.
(13) Source: Eurostat (online data code: ilc_li10).
(14) Reasons for this could include that many elderly people receive regular pensions, have accrued some wealth and have often paid off their housing situation.
(15) European Council (2013), *Council Recommendation of 22 April 2013 on establishing a Youth Guarantee*, 2013/C 120/01.
(16) In EU-SILC, disability is approximated according to the concept of global activity limitation, which is defined as a 'limitation in activities people usually do because of health problems for at least the past six months'. This is considered to be an adequate proxy for disability, both by the scientific community as well as disabled persons' organisations.
(17) Source: Eurostat (online data code: ilc_iw02).
(18) Source: Eurostat (online data code: ilc_iw16).
(19) Source: Eurostat (online data code: ilc_iw04).
(20) For more insights, see: European Institute for Gender Equality (2016), *Poverty, gender and intersecting inequalities in the EU: Report*, Publications Office of the European Union, Luxembourg.
(21) Source: Eurostat (online data code: ilc_iw05).
(22) Source: Eurostat (online data code: ilc_iw07).
(23) Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006.
(24) For more information on the definition of adequate housing see: United Nations (2014), *The Right to Adequate Housing: Fact Sheet No. 21/Rev.1*.
(25) Eurocities Network of Local Authority Observatories on Active Inclusion (2010), *Supporting Active Inclusion Through Housing – A Response From Five European Cities.*
(26) A household is considered overcrowded it does not have at least one room for the entire household as well as a room for a couple, for each single person above 18, for a pair of teenagers (12 to 17 years of age) of the same sex, for each teenager of different sex and for a pair of children (under 12 years of age).
(27) For more information see: FEANTSA and Abbé Pierre Foundation (2018), *Third overview of housing exclusion in Europe*, as well as European Commission (2007), *Measurement of homelessness at EU level*.
(28) Source: Eurostat (online data code: hlth_silc_08)
(29) The equivalised disposable income is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults; household members are equalised or made equivalent by weighting each according to their age, using the so-called modified OECD equivalence scale.

2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 2 seeks to end hunger and malnutrition and ensure access to safe, nutritious and sufficient food. Realising this goal is largely dependent on increased investment in rural infrastructure and agricultural research and development and on promoting sustainable production systems.

eurostat supports the SDGs

In the EU, achieving healthy diets and ensuring agricultural systems remain productive and sustainable in the future are the key challenges associated with SDG 2. Unlike many areas of the world that face hunger, the EU's central nutritional issue is obesity, which can also harm health and well-being and have adverse impacts on health and social systems, governmental budgets and the productivity and growth of the economy. Furthermore, sustainable and productive agricultural systems are essential for ensuring a consistent supply of nutritious food now and in the future, especially in the face of challenges such as climate change and a rising population. However, while agricultural productivity has increased in Europe in recent decades, its negative impacts on nature and the environment could threaten long-term productivity and the ability to provide healthy and sustainable diets.

Table 2.1: Indicators measuring progress towards SDG 2, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Malnutrition			
Obesity rate	:	:	page 55
Sustainable agricultural production			
Agricultural factor income per annual work unit (AWU)	↑ (1)	↑	page 56
Government support to agricultural research and development	:	↓	page 57
Area under organic farming	↑ (2)(3)	↑ (3)	page 58
Gross nitrogen balance on agricultural land	↗ (2)	↘	page 59
Adverse impacts of agricultural production			
Ammonia emissions from agriculture	↗	↘	page 60
Nitrate in groundwater (*)	↗ (1)	↑	SDG 6, page 125
Estimated soil erosion by water (*)	↑ (1)	:	SDG 15, page 289
Common farmland bird index (*)	↓	↘	SDG 15, page 291
Grassland butterfly index (*)	↓	↓	SDG 15, page 292

(*) Multi-purpose indicator.
(1) Past 12-year period.
(2) Past 11-year period.
(3) Trend refers to EU-27 (until 2011) and EU-28 (2012 onwards).

Table 2.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
🎯	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Zero hunger in the EU: overview and key trends

Monitoring SDG 2 in an EU context focuses on the topics malnutrition, sustainable agricultural production and the adverse impacts of agricultural production. As Table 2.1 shows, the EU has made progress in some areas of sustainable agricultural production over the past few years. However, there is still room for improvement in terms of the negative impacts of agriculture, where the picture is mixed — biodiversity-related indicators show a negative trend, while in other areas progress is visible, especially when viewed over the long term.

Malnutrition

Nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition — an adequate, well-balanced diet combined with regular physical activity and the avoidance of excessive alcohol consumption and tobacco use — is a cornerstone of good health. Whereas in many other parts of the world hunger is the main challenge related to malnutrition, in Europe obesity presents the most serious nutrition-related health issue.

Obesity levels are high across Europe, with disparities between age and educational groups

15.9%
of the EU's adult population were obese in 2014

Obesity is a malnutrition problem that is on the rise across Europe and the world. In the age of globalisation and mechanisation, consumption and activity habits are changing. Supporting a balanced nutritional diet with an adequately active lifestyle is a challenge for many. While the causes of obesity vary for each person, the problem is generally attributed to poor diets of foods high in fat, salt and sugar, lifestyle

The Commission supports the Member States in the implementation of the 2007 Strategy on Nutrition, Overweight and Obesity-related Health Issues ([1]) through the High Level Group on Nutrition and Physical Activity and the EU Platform for Action on Diet, Physical Activity and Health.

The High Level Group on Nutrition and Physical Activity ([2]) consists of government representatives that work on improving food product recipes; reducing children's exposure to the marketing of foods high in fat, salt and sugars; promoting physical activity; consumer information (labelling); and public procurement of food. The High Level Group agreed in 2011 on an EU Framework for National Initiatives on Selected Nutrients, such as saturated fat and added sugars. A 2008 reformulation framework had been agreed to reduce salt in food.

The EU Platform for Action on Diet, Physical Activity and Health ([3]) was launched in March 2005, bringing together the key European-level organisations working in the field of nutrition and physical activity. It is a forum for the food industry, public health NGOs, consumer organisations and health professionals who aim to halt the worrying rise in the number of overweight and obese people in Europe, and to support the EU Member States in reaching the UN Sustainable Development Goals and the WHO targets on non-communicable diseases. To date, the platform has developed more than 300 commitments covering a variety of actions, from reformulation of food products and reduction of offered portion sizes, to advocacy and consumer information, to promoting physical activity.

choices characterised by low physical activity and high caloric consumption, and sociological and hereditary factors.

Obesity is a significant health issue in the EU, affecting 15.9 % of the total adult population in 2014. It also disproportionately affects people with lower levels of education: 19.9 % of adults with a low level of education were obese in 2014, whereas only 16.0 % and 11.5 % of people with medium and high education levels, respectively, fell into this category. Because lower education levels tend to be associated with economic and social disadvantages, obesity is a bigger issue among socially vulnerable groups. To tackle this trend, some EU countries have implemented policies to target vulnerable populations with obesity campaigns and interventions ([4]). Obesity also generally tends to increase with age until late in life. In 2014, the obesity rate peaked among older Europeans aged 65 to 74 and fell again after the age of 75.

When considered with pre-obesity, the situation looks more severe, affecting more than 50 % of the total EU population. Patterns in the pre-obesity rate follow patterns in the obesity rate, though pre-obesity affects more than twice as many Europeans as obesity (35.7 % of the total adult population). Though there are not enough data to show a long-term trend for the whole EU, 14 of the 17 EU countries for which two data points are available show a rise in the obesity rate between 2008 and 2014. This indicates the problem may be growing in severity in the EU, although more data would be needed to draw a robust conclusion.

Sustainable agricultural production

Sustainable agricultural production is a key element in the fight against hunger and malnutrition. A concerted effort is therefore needed to create a food production system that is based on sustainable agricultural practices and produces an adequate supply of food in line with national and international governmental dietary guidelines. Ensuring a healthy, sustainable supply of food, both now and in the long term, is especially important in the face of challenges such as climate change and a rising population.

Agriculture is a complex field. To give a complete picture of agricultural production, indicators must cover the economic and ecological aspects of sustainability by addressing a variety of topics, ranging from monetary aspects (income, government support) to specific farming practices (organic farming, nutrient balance). The overall picture painted by these indicators regarding progress towards SDG 2 in an EU context is however mixed, especially when viewed over the short term.

Labour productivity in European agriculture has increased, but investments in the future of farming lag behind

20.6 %
growth in EU agricultural factor income per annual work unit between 2010 and 2017

Economic sustainability needs to be achieved in the European agricultural sector to ensure its long-term viability. Agricultural factor income per annual work unit (AWU) is an indicator of labour productivity. Following a dip during the economic crisis in the late 2000s, agricultural factor income per AWU has been rising in Europe and is currently at 20.6 % above 2010 levels. This is mainly due to strong growth between 2010 and 2011 (by 9.1 %) and again between 2016 and 2017 (by 8.4 %), driven partly by increased output values (prices and/or yields) and partly by a reduced labour force.

Agricultural factor income per AWU varies considerably between Member States. It tends to be higher in countries with more mechanised, input-intensive production systems than in countries using more traditional, labour-intensive methods. Differences in wage levels and employment opportunities outside agriculture might also play a role, as they can provide alternatives for labourers.

Additional data from the economic accounts for agriculture confirm that the economic viability of the EU's agricultural sector appears to be

At the 2015 Milan Expo, the European Commission made a commitment to consult and debate how the EU could future-proof food systems through innovation and investment. As a response, in autumn 2016 the Commission launched the FOOD 2030 initiative ([5]). The initiative seeks to develop a coherent research and innovation agenda for sustainable food and nutrition systems. It highlights the need for new business models and investment to provide enough sustainable and safe high-quality food, citizen involvement, and capacity and skills raising. It also supports future research framework programming to promote a 'food systems approach'. Outcomes will feed into a number of European policy processes, such as the development of the 2021–2027 Multiannual Financial Framework (MFF), the 9th Framework Programme (FP), the next generation of the Common Agricultural Policy and the review of the Bioeconomy Strategy ([6]).

increasing, with entrepreneurial income growing ([7]). From 2010 to 2017, net agricultural entrepreneurial income per unpaid AWU rose by 33.2 % and total net entrepreneurial income of agriculture grew by 16.7 %. Similar to agricultural factor income, there are a number of possible reasons for these trends, such as rising agricultural prices and a decline in the amount of human labour associated with industrialised agricultural systems.

The sustainability of the agricultural sector depends to a large extent on investment in the future of farming. A crucial part of this is investment in research and innovation, which helps to keep farmers competitive and able to adapt to challenges. Overall in the EU, national government support to agricultural research and development has shown decline in the short term, falling by 1.2 % a year on average between 2011 and 2016. However, investment has shown an upward swing over the past two years from a low of EUR 3.0 billion in 2014 up to EUR 3.1 billion in 2016. The trend varies across Member States according to national resources and funding priorities, with some increasing in recent years, while others have decreased. In relation to other sectors, government spending data from 2016 indicate agricultural R&D is a medium priority for Member States. Research in this sector received more government investment than, for example, transport, telecommunication and other infrastructures (EUR 2.7 billion) and education (EUR 1.3 billion), but less than industrial production and technology (EUR 8.7 billion) and health (EUR 8.5 billion) ([8]).

3.1
billion EUR in government support was spent on agricultural R&D in 2016

Organic agriculture is on the rise across Europe, but nutrient use can become more efficient

Organic agriculture represents a sustainable agricultural production system that seeks to reduce the negative impacts of farming on nature and the environment compared with conventional production systems. Organic agriculture is on the rise across the EU. The share of organic agriculture in total agricultural area nearly doubled from 2005 to 2016, rising from 3.6 % to 6.7 %. Austria leads the EU with more than 20 % of its agricultural area farmed organically, followed by Sweden, Estonia, the Czech Republic and Latvia.

Several statistics indicate that organic agriculture is well set to continue growing in Europe. Demand for organic food, for example, is steadily increasing in Europe ([9]). The value of the organic retail market in the EU was EUR 30.7 billion in 2016, with retail

6.7 %
of the EU's utilised agricultural area was farmed organically in 2016

sales growth of 12.0 % between 2015 and 2016 ([10]). The number of organic producers has also been increasing in Europe, reaching 295 123 in 2016 ([11]). In 10 Member States, the area under conversion to organic agriculture was between 10 % and 20 % of their total organic area, and over 20 % in a further 15 Member States ([12]). This suggests that further growth in the organic sector's production and economic importance can be expected across the EU.

The gross nitrogen balance on agricultural land gives information about the environmental impacts of nutrient use and management on farms. This measure represents the balance of nitrogen inputs (for example, mineral fertiliser and manure) and outputs (such as via harvested crops) from agricultural production. While low nitrogen levels may indicate poor soil fertility, persistently high levels can cause nitrate leaching (water pollution), ammonia emissions and ecosystem disruptions (see next section on adverse impacts of agricultural production). Since 2004, the EU has seen its nitrogen balance on agricultural land fluctuate around a surplus of 50 kg per hectare. After reaching a low of 46 kg per hectare in 2009, the EU's nitrogen surplus has increased in recent years, reaching 51 kg per hectare in 2015. A return to the downward trend is needed to make progress towards SDG 2.

In 2015, the gross nitrogen balance on agricultural land in the EU showed a surplus of

51 kg

per hectare

Adverse impacts of agricultural production

Agriculture provides environmental benefits such as maintaining specific farmland ecosystems and diverse landscapes. However, considerable increases in agricultural productivity in Europe since 1950 have also magnified its harmful environmental impacts. Several indicators relating to agriculture's adverse impacts on the environment can help determine the overall sustainability of agricultural production. They show some positive trends, but also a number of worrisome developments over the past few years, including growing ammonia emissions from agriculture and declines in farmland biodiversity.

Excessive nutrient inputs are threatening the environment and water quality

Ammonia emissions and nitrates in groundwater are linked to excess inputs of nitrogen from agricultural sources such as mineral fertiliser and livestock manure. When released into the atmosphere, ammonia pollutes the air and can harm sensitive vegetation systems, biodiversity and water quality through eutrophication and acidification. Since the 1990s, Europe has seen significant decreases in its ammonia emissions from agriculture due to reductions in livestock density and nitrogen fertiliser use as well as changes in agricultural practices. In recent years, however, this trend has reversed. After reaching a low of 3.50 million tonnes in 2013, emissions started to increase again, reaching 3.61 million tonnes in 2016. Note that the national and EU totals might mask considerable variations in fertiliser application and livestock densities at regional and local levels.

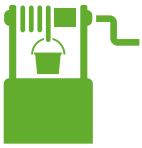
3.61

million tonnes of ammonia were emitted from agriculture in the EU in 2016

The agricultural sector is also responsible for considerable quantities of greenhouse gas (GHG) emissions ([13]), accounting for almost 10 % of total GHG emissions in the EU in 2016. While total emissions have been falling steadily in the EU (see the chapter on SDG 13 'Climate action' on page 239), GHG emissions from the agricultural sector have been slowly rising since 2010. They exceeded 430 million tonnes of CO_2 equivalent in 2016, although this figure is still below 1990 levels ([14]). Growing emissions can be attributed to increased productivity in the agricultural sector.

Nitrates can end up in groundwater when more fertiliser is applied than the plants need. This

can lead to eutrophication and reduce groundwater quality. Overall, the EU average concentration of nitrates in groundwater (19.1 mg/L in 2012) is within the limits set by the Nitrates Directive ([15]) and Drinking Water Directive ([16]). After peaking at 20.4 mg NO_3 per litre in 2006 and 2007, the overall concentration of nitrates in EU groundwater has returned to levels observed in the early 2000s. Between 2009 and 2012 levels were back to around 19.3 and 19.0 mg NO_3 per litre (see the chapter on SDG 6 'Clean water and sanitation' on page 125). However, for the period 2012 to 2015, Member States reported that 13.2 % of groundwater stations were considered polluted according to the Nitrates Directive (their average annual nitrate concentration exceeded 50 mg nitrates per litre), and during this period there were still important unresolved regional pressures and pollution hotspots ([17]).



19.1

milligrams of nitrates were in each litre of groundwater on average in the EU in 2012

There are also vast differences in the performance of Member States in relation to excessive nitrogen input. Countries such as Malta, Cyprus, Belgium, Luxembourg and the Netherlands have the highest rates of ammonia emissions and nitrates in groundwater. Romania, Estonia, Lithuania, Bulgaria, and Latvia – all countries with relatively low-intensity agriculture — have the lowest ammonia emissions.

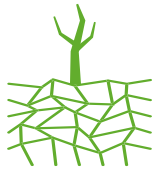
The Nitrates Directive ([18]) was introduced in 1991 to reduce fertiliser use. It aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices. It has contributed to decreases in the nitrogen balance, but major efforts are still needed to restore optimal water quality across the EU.

Soil erosion: a major threat, but there are signs of improvement across Europe

Healthy soils are essential for sustainable and productive agricultural systems. Because soils take years to form, they can be considered a non-renewable resource for food production. One of the biggest threats to soil health in Europe is soil erosion, which can be caused by both wind

The Soil Thematic Strategy ([19]) is the main EU policy strategy directed at soil protection. The EU and most EU Member States do not have specific legislation targeting soils, but instead aspects of soil protection are determined by other sectoral policies such as agriculture, forestry, water, waste and land use planning. The Soil Thematic Strategy sought to change this by establishing four pillars for action at EU level: dedicated legislation in the form of a Soil Framework Directive, integration of soil protection aspects in other sectoral policies, development of the knowledge-base through studies and research projects, and raising public awareness about the role that soil plays in the economy and the ecosystem ([20]). Though the proposal for a Soil Framework Directive was dropped in 2014, progress has been made towards other objectives. The EU has funded research and improved soil monitoring through projects such as LUCAS, a survey on land cover, land use and agro-environmental indicators run by Eurostat, and Copernicus, the EU's Earth Observation and Monitoring Programme, which provides, for example Corine Land Cover and High Resolution Layers on imperviousness, grasslands, forests, water and wetness. The Commission has worked to integrate soil concerns into other sectoral policies, and rehabilitation projects have been funded, for example, through the Cohesion Policy ([21]).

and water. Though erosion is a natural process, inappropriate land management and other human activities can cause it to accelerate to such an extent that soil can be irreversibly lost. The indicator on estimated soil erosion by water provides a measure of the area at risk of severe soil erosion (leading to the loss of more than 10 tonnes per hectare per year). The Mediterranean region is especially affected, because it experiences long, dry periods and sudden rainfall events on steep slopes with fragile soils ([22]). Water erosion can also harm the environment by washing nutrients out of soils and into water bodies, leading to water quality problems such as toxic algal blooms ([23]).



201 885
km² of EU land was estimated to be at risk of severe soil erosion by water in 2012

In the EU, 201 885 km² of land were at risk of severe soil loss from water erosion in 2012 — an area equal to about 1.5 times the total land area of Greece. Yet the risk of severe soil erosion has been declining in the EU, in part due to mandatory cross-compliance measures in the EU Common Agricultural Policy (CAP). The share of non-artificial erosive area estimated to be at risk of severe soil erosion by water decreased from 6.0 % to 5.2 % between 2000 and 2012.

High agricultural productivity can harm biodiversity

Agricultural landscapes provide valuable and unique habitats for a host of species, both common and threatened. However, unless the features that support biodiversity also generate income for farmers, they will come under growing pressure in the race to increase productivity.

Agricultural species would have fared worse without the agri-environmental measures in EU policies such as the Common Agriculture Policy, but existing measures have not yet been enough to halt biodiversity loss in agricultural habitats ([24]).

Between 2000 and 2015, common farmland birds in the EU declined by
15.8 %

Farmland birds and grassland butterflies are two groups of species that depend on agricultural habitats. Their attractiveness and relative visibility make them good indicator species for monitoring biodiversity. The common farmland bird index and the grassland butterfly index measure the relative abundance and diversity compared to the base year of 2000 for 39 farmland bird species and for 17 grassland butterfly species. Between 2000 and 2015, the EU saw considerable declines in both indices, by 15.8 % for common farmland birds and by 17.0 % for grassland butterflies. The availability of data for both indicators needs to be improved, as data are in general not available for individual EU Member States. However, all 16 Member States that provided data for the common farmland bird index in 2014 report an index decrease compared with 2000 (except Latvia), ranging from 7.0 % in Ireland to 41.8 % in Austria ([25]). No country breakdown is available for butterflies

Between 2000 and 2015, grassland butterfly populations in Europe shrank by
17.0 %

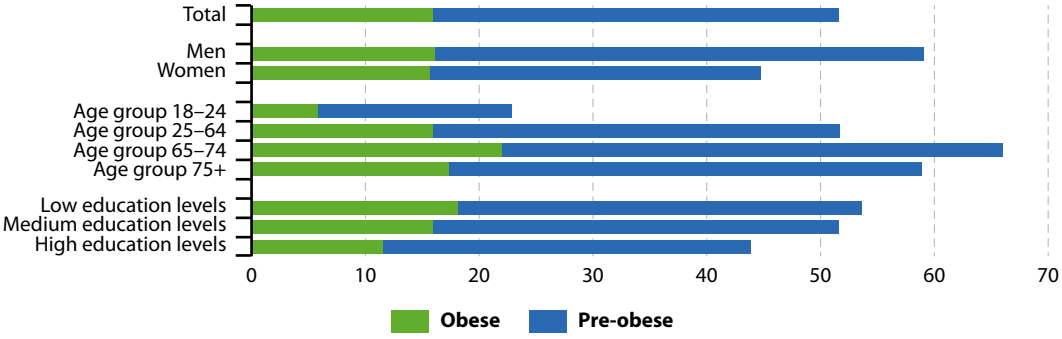
Presentation of the main indicators

Obesity rate

X Insufficient data to calculate trends

The obesity indicator is derived from the body mass index (BMI), which is defined as the weight in kilograms divided by the square of the height in metres. People aged 18 years or over are considered obese if their BMI is equal to or greater than 30. The category pre-obese refers to people with a BMI between 25 and less than 30. The category overweight (BMI equal or greater than 25) combines the two categories pre-obese and obese. The data presented in this section come from the European Health Interview Survey (EHIS).

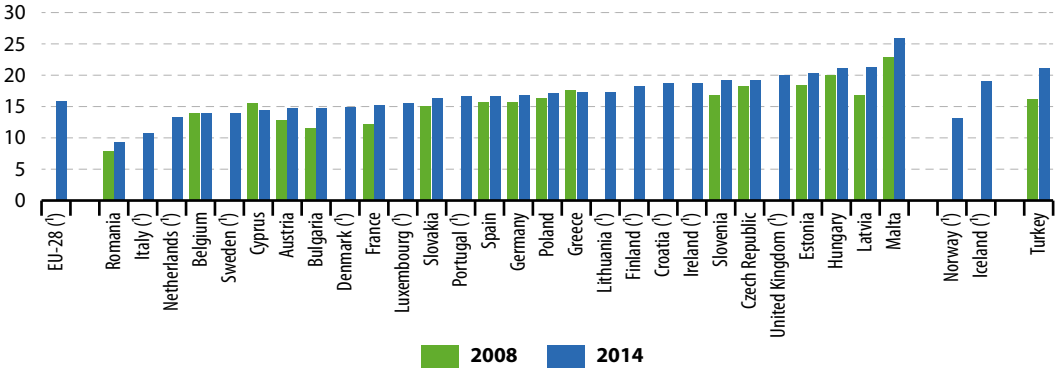
Figure 2.1: Obesity rate, by sex, age group and educational attainment, EU-28, 2014
(% of population aged 18 or over)



Source: Eurostat (online data code: sdg_02_10)

In 14 out of 17 EU countries for which data are available for both 2008 and 2014, the obesity rate is trending upwards. Factors such as age and education seem to affect the prevalence of obesity. Higher obesity rates correlate with lower education levels. Obesity rates in the age group 25 to 64 were more than double that of 18 to 24-year-olds and peaked among the age group 65 to 74. While gender is less of a determinant for obesity, the pre-obesity rate among men (43 %) was 14 percentage points higher than the rate among women (29 %) in 2014.

Figure 2.2: Obesity rate, by country, 2008 and 2014
(% of population aged 18 or over)



(1) No data for 2008.

Source: Eurostat (online data code: sdg_02_10)

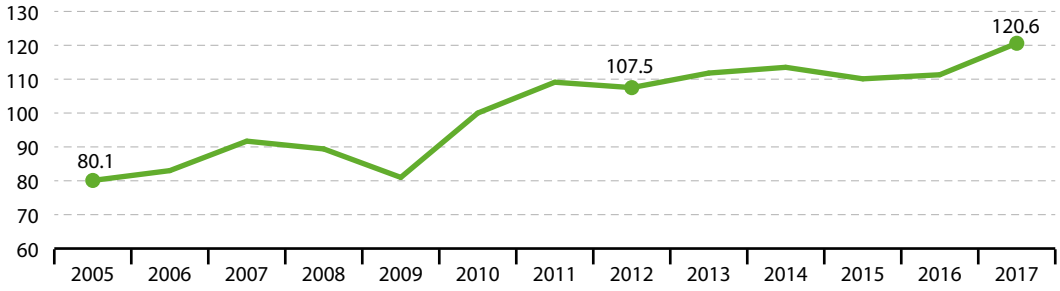
LONG TERM 2005–2017

SHORT TERM 2012–2017

Agricultural factor income per annual work unit (AWU)

Agricultural factor income measures the income generated by farming, which is used to remunerate borrowed or rented factors of production (capital, wages and land rents) as well as own production factors (own labour, capital and land). Annual work units (AWUs) are defined as full-time equivalent employment (corresponding to the number of full-time equivalent jobs), which is calculated by dividing total hours worked by the average annual number of hours worked in full-time jobs within the economic territory. This can be interpreted as a measure of labour productivity in the agricultural sector. The data stem from the Economic Accounts for Agriculture (EAA), which provide detailed information on agricultural sector income.

Figure 2.3: Agricultural factor income per annual work unit (AWU), EU-28, 2005–2017
(index 2010=100)

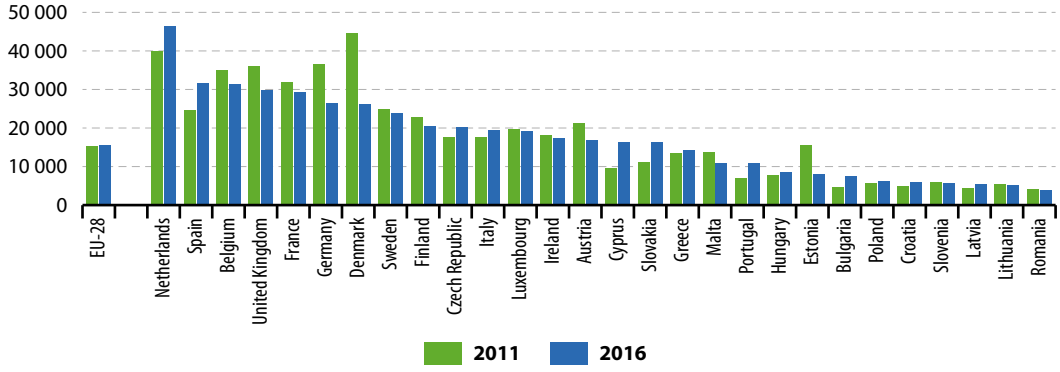


Note: 2009 and 2010 data are provisional, 2017 data are estimates.

Source: Eurostat (online data code: sdg_02_20)

Figure 2.3 shows an almost continuous increase in agricultural factor income per AWU that was mainly interrupted by the economic crisis in 2008 and 2009. Between 2005 and 2017, factor income per AWU grew by 3.5 % per year on average. In the short term, between 2012 and 2017, the growth rate was slower, at 2.3 % per year.

Figure 2.4: Agricultural factor income per annual work unit (AWU), by country, 2011 and 2016
(EUR, chain linked volumes (2010))



Note: Caution should be exercised when comparing absolute levels of agricultural factor income per AWU as they are influenced by different calculations depending on national rules and are not specifically designed to be comparable across countries.

Source: Calculations made by the Directorate-General for Agriculture and Rural Development (DG AGRI) based on Eurostat data (online data code: sdg_02_20)

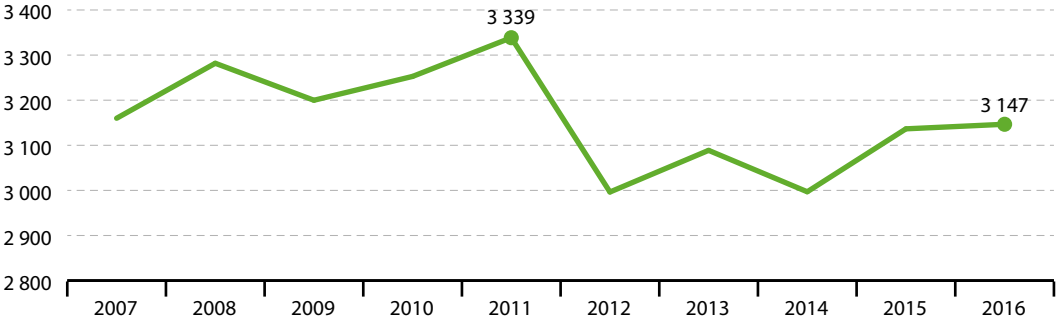
Government support to agricultural research and development

LONG TERM
Insufficient data to calculate trend

SHORT TERM
2011–2016

This indicator refers to Government Budget Appropriations or Outlays on R&D (GBAORD). GBAORD data measure government support to research and development (R&D) activities, or, in other words, how much priority governments place on the public funding of R&D. GBAORD data are built up using the guidelines laid out in the proposed standard practice for surveys of research and experimental development, the OECD's Frascati Manual from 2002.

Figure 2.5: Government support to agricultural research and development, EU-28, 2007–2016 (million EUR)

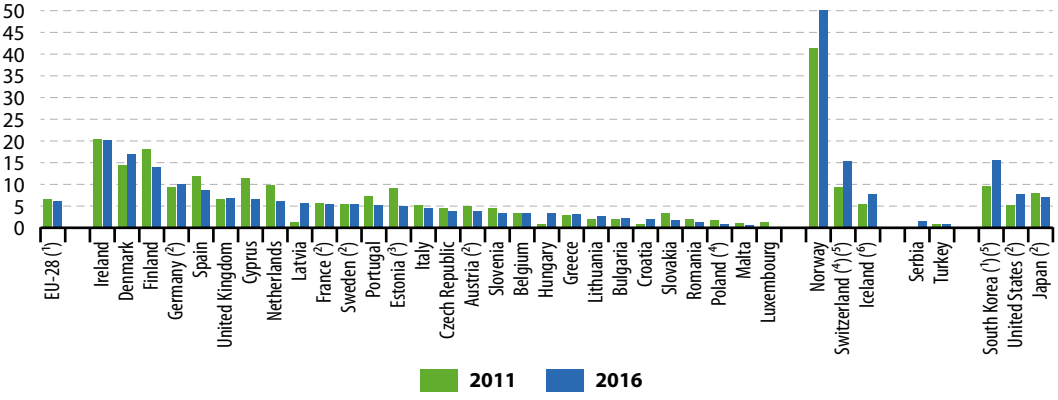


Note: Data for 2007 and for 2009–2011 are estimates.

Source: Eurostat (online data code: sdg_02_30)

As shown in Figure 2.5, government support to agricultural research and development fluctuated quite strongly over the past decade. The short-term trend between 2011 and 2016 shows an average annual decrease in government funding of 1.2 %. This is mainly due to a strong drop from 2011 to 2012, while the funding has increased again since 2014. Data are not sufficient to assess a long-term trend.

Figure 2.6: Government support to agricultural research and development, by country, 2011 and 2016 (EUR per capita)



(1) 2011 data are estimates.
(2) Definition differs.
(3) Estimated data.
(4) 2012 data (instead of 2011).
(5) 2015 data (instead of 2016).
(6) 2014 data (instead of 2011).

Source: Eurostat (online data code: sdg_02_30)

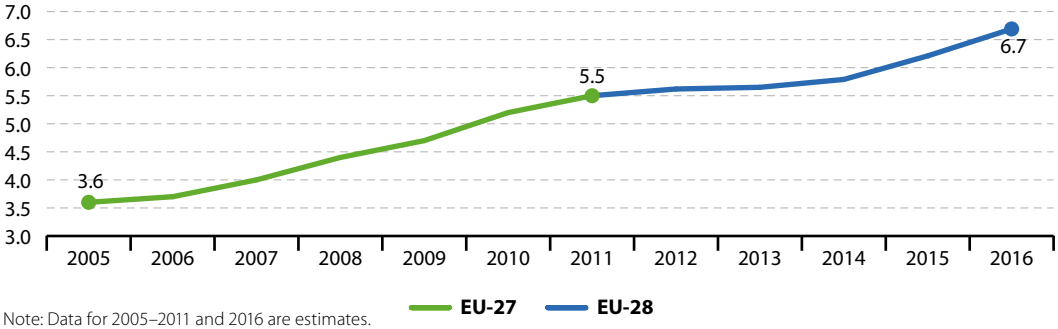
LONG TERM 2005–2016

SHORT TERM 2011–2016

Area under organic farming

This indicator is defined as the share of total utilised agricultural area (UAA) occupied by organic farming (existing organically farmed areas and areas in process of conversion). Organic farming is a production method that puts the highest emphasis on environmental protection and animal welfare considerations. It avoids or largely reduces the use of synthetic chemical inputs such as fertilisers, pesticides, additives and medical products.

Figure 2.7: Area under organic farming, EU-27 and EU-28, 2005–2016
(% of utilised agricultural area)

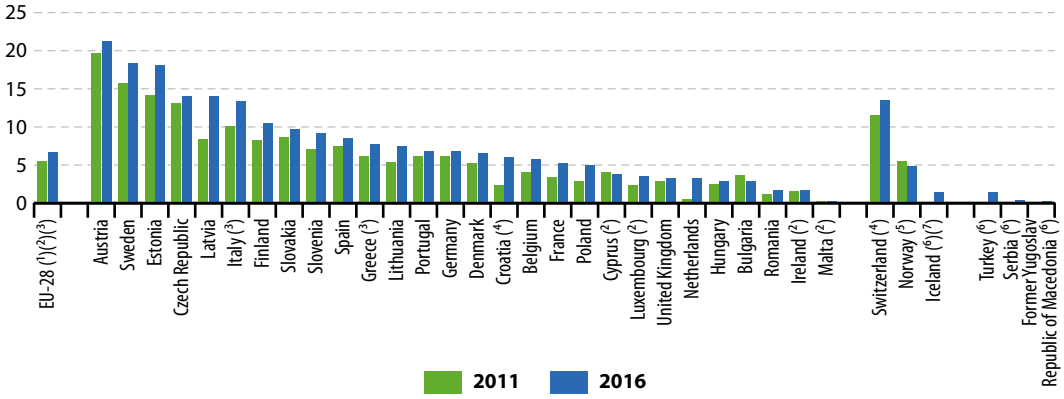


Note: Data for 2005–2011 and 2016 are estimates.

Source: Eurostat (online data code: sdg_02_40)

Figure 2.7 shows a continuous expansion of organic farming practices across the EU over the past decade. Between 2005 and 2016, the area grew annually by 5.8 %. In the short term between 2011 and 2016 growth rates were slower, at 4.0 % per year on average.

Figure 2.8: Area under organic farming, by country, 2011 and 2016
(% of utilised agricultural area)



(1) 2011 data refer to EU-27.
(2) 2011 data are estimates.
(3) 2016 data are estimates.
(4) 2012 data (instead of 2010).
(5) 2009 data (instead of 2010).
(6) No data for 2011.
(7) 2015 data (instead of 2016).

Source: Eurostat (online data code: sdg_02_40)

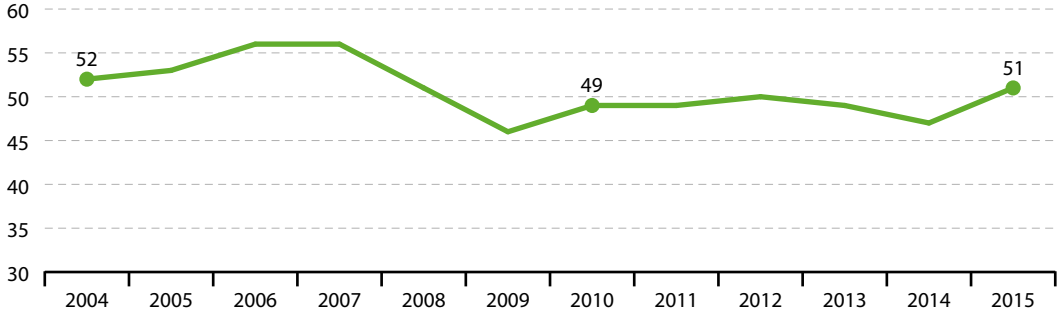
Gross nitrogen balance on agricultural land

LONG TERM 2004–2015

SHORT TERM 2010–2015

This indicator measures the potential surplus or deficit of nitrogen in agricultural soils. A lack of nitrogen may lead to degradation in soil fertility, while an excess may cause surface and groundwater (including drinking water) pollution and eutrophication. Ideally, the ratio of nitrogen input and output to the soil should be balanced. Inputs consist of the amount of nitrogen applied via mineral fertilisers and animal manure as well as nitrogen fixation by legumes, deposition from the air, and some other minor sources. Nitrogen output is contained in the harvested crops, or grass and crops eaten by livestock (escape of nitrogen to the atmosphere, for example, as N_2O, is difficult to estimate and therefore not taken into account).

Figure 2.9: Gross nitrogen balance on agricultural land, EU-28, 2004–2015
(kg per hectare)

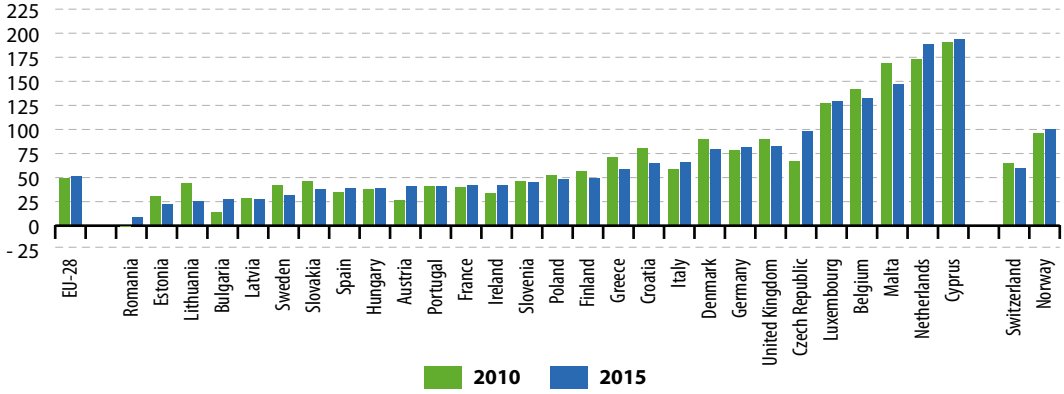


Note: Estimated data.

Source: Eurostat (online data code: sdg_02_50)

As indicated in Figure 2.9, the long-term trend of the gross nitrogen balance on agricultural land over the period 2004 to 2015 has shown a decrease at an average rate of 0.2 % annually. However, in the short term between 2010 and 2015 there has been an average annual increase of 0.8 %, mainly as a result of the most recent rise in the nitrogen surplus in 2015.

Figure 2.10: Gross nitrogen balance on agricultural land, by country, 2010 and 2015
(kg per hectare)



Note: Estimated or provisional data for many countries.

Source: Eurostat (online data code: sdg_02_50)

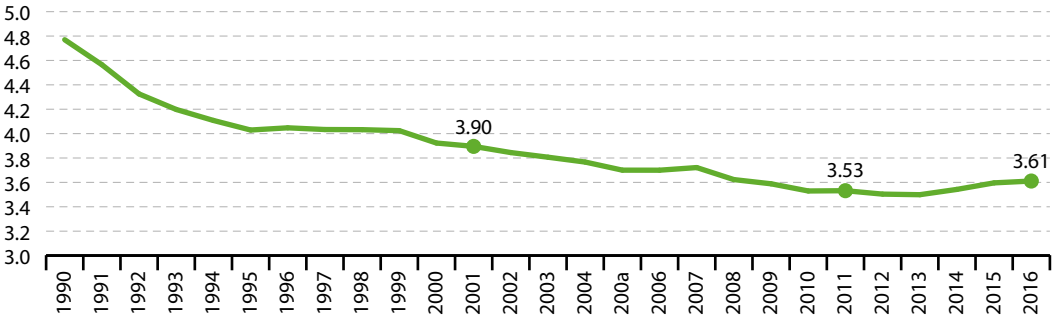
LONG TERM
2001–2016

SHORT TERM
2011–2016

Ammonia emissions from agriculture

The indicator measures the amount of ammonia (NH_3) emissions as a result of the agricultural production. Ammonia (NH_3) is a colourless, pungent-smelling and corrosive gas that is produced by decaying organic vegetable matter and from the excrement of humans and animals. When released into the atmosphere, it contributes to air pollution. Once deposited in water and soils, it can cause two major types of environmental damage: acidification and eutrophication. Data for this indicator come from the EU inventory on air pollution compiled by the European Environment Agency (EEA) under the Convention on Long-range Transboundary Air Pollution (LRTAP) and are fully consistent with national air pollution inventories compiled by the EU Member States.

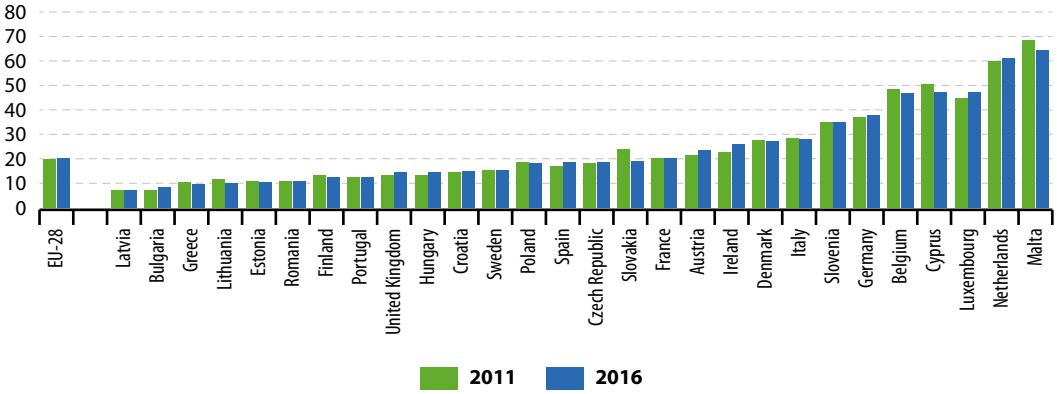
Figure 2.11: Ammonia emissions from agriculture, EU-28, 1990–2016
(million tonnes)



Source: European Environment Agency (online data code: sdg_02_60)

The long-term, moderately favourable, trend in ammonia emissions that has been visible since 1990, has reversed to a moderately unfavourable trend in recent years. Between 2001 and 2016, ammonia emissions from EU agriculture fell by an average of 0.5 % per year. However, between 2011 and 2016, the EU saw an average annual increase in emissions of 0.4 %.

Figure 2.12: Ammonia emissions from agriculture, by country, 2011 and 2016
(kg per ha of utilised agricultural area)



Source: European Environment Agency (online data code: sdg_02_60)

Further reading on Zero Hunger

European Commission (2018), *Initiatives on Nutrition and Physical Activity*, Brussels, European Commission.

European Environment Agency (2017), *Food in a green light — A systems approach to sustainable food*, Copenhagen, EEA.

European Environment Agency (2016), *State of the Environment 2015: Agriculture*, Copenhagen, EEA.

FAO, IFAD, UNICEF, WFP and WHO (2017), *The State of Food Security and Nutrition in the World (SOFI) Report*, Rome, FAO Publishing.

FAO (2016), *Food and Agriculture: Key to achieving the 2030 Agenda for Sustainable Development*, Rome, FAO Publishing.

OECD (2017), *Obesity Update 2017*, OECD.

Rodríguez-Eugenio N., McLaughlin M. and Pennock D. (2018), *Soil Pollution: a hidden reality*, Rome, FAO Publishing.

Further data sources on Zero Hunger

Eurostat, Economic accounts for agriculture — agricultural income (indicators A, B, C).

Eurostat, Organic farming statistics.

FiBL, FiBL Statistics — Europe — Key indicators.

Notes

(1) European Commission, *Strategy on nutrition, overweight and obesity-related health issues*.
(2) European Commission, *High Level Group on Nutrition and Physical activity*.
(3) European Commission (2016), *Monitoring the activities of the EU Platform for Action on Diet, Physical Activity and Health Annual Report 2016*, ICF Consulting Services Ltd for European Commission Directorate-General for Health and Food Safety Directorate C — Public Health Unit C4 — Health Determinants and inequality.
(4) OECD and EU (2016), *Health at a Glance: Europe 2016 State of health in the EU cycle*, OECD Publishing, Paris.
(5) European Commission, Bioeconomy: *FOOD2030.*
(6) CommBeBiz (2017), *FOOD 2030 — Transforming our food systems through science. CommBeBiz magazine 2017–2018*, Pracsis Communication for the European Commission, Brussels, Belgium.
(7) Source: Eurostat (online data code: aact_eaa06).
(8) Source: Eurostat (online data code: gba_nabsfin07).
(9) European Commission (2014), Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions, *Action Plan for the future of Organic Production in the European Union*, COM(2014) 179 final.
(10) Source: *FiBL Statistics — Europe — Key indicators*, Research Institute of Organic Agriculture. Data covers EU-28 excluding Malta and Estonia, for which data is not available.
(11) Source: *FiBL Statistics — Europe — Key indicators*, Research Institute of Organic Agriculture. Data covers EU-28.
(12) Eurostat, *Organic farming statistics, Statistics Explained*.
(13) Such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and the so-called F-gases (hydrofluorocarbons (HFC), perfluorocarbons (PFC), nitrogen triflouride (NF_3) and sulphur hexafluoride (SF_6)).
(14) Source: Eurostat (online data code: env_air_gge).
(15) European Commission, the Nitrates Directive.
(16) European Commission, the Drinking Water Directive.
(17) European Commission (2018), *Report from the Commission to the Council and the European Parliament on the implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2012–2015*, COM(2018) 257 final, Brussels, p. 5.
(18) Council of the European Communities (1991), *Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources*.
(19) European Commission (2006), *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions — Thematic Strategy for Soil Protection [SEC(2006)620][SEC(2006)1165]*.
(20) Ibid.
(21) European Commission (2012), *Environment: Commission calls for a stronger response to soil degradation*, European Commission Press Release.
(22) Joint Research Centre (2012), *The State of Soil in Europe: A contribution of the JRC to the European Environment Agency's Environment State and Outlook Report 2010*, European Union Publications Office.
(23) Ibid.
(24) European Commission (2016), *Fitness Check of the EU Nature Legislation (Birds and Habitats Directives)*, Commission Staff Working Document, SWD(2016) 472 final.
(25) Source: Eurostat (online data code: env_bio2).

3 Ensure healthy lives and promote well-being for all at all ages

Goal 3 aims to ensure health and promote well-being for all at all ages by improving reproductive, maternal and child health; ending the epidemics of major communicable diseases; and reducing non-communicable and mental diseases. It also calls for reducing behavioural and environmental health-risk factors.

eurostat supports the SDGs

The World Health Organization (WHO) defines health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' ([1]). Good health is not only of value to the individual as a major determinant of quality of life, well-being and social participation, it also contributes to general social and economic growth. Besides the general availability of healthcare, health can be determined by individual characteristics and behaviour, such as smoking, and by external socio-economic and environmental factors, such as living conditions, air quality and noise. Research is also essential to ensuring health and tackling diseases. Thus, the achievement of the SDG on good health and well-being is strongly linked to other areas related to sustainable development. Ensuring that people can live a long and healthy life also means to reduce the causes of premature deaths, such as unhealthy lifestyles or accidents, to improve the external health determinants and to ensure access to healthcare for all.

Table 3.1: Indicators measuring progress towards SDG 3, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Healthy lives			
Life expectancy at birth	↗ (1)	↗	page 73
Share of people with good or very good perceived health	↗ (2)(3)	↘	page 74
Health determinants			
Smoking prevalence	↑ (2)(4)	↑ (2)	page 75
Obesity rate (*)	:	:	SDG 2, page 55
Population living in households considering that they suffer from noise (*)	:	↑	SDG 11, page 209
Exposure to air pollution by particulate matter (*)	↘	↑	SDG 11, page 210
Causes of death			
Death rate due to chronic diseases	↑ (5)	↑	page 76
Death rate due to tuberculosis, HIV and hepatitis	↑ (5)	↑	page 77
People killed in accidents at work (*)	:	↑	SDG 8, page 164
People killed in road accidents (*)	↗	↘	SDG 11, page 212
Access to health care			
Self-reported unmet need for medical care	:	↑	page 78

(*) Multi-purpose indicator.
(1) Past 14-year period.
(2) Data for different years refer to different EU aggregates (EU-25, EU-27 and/or EU-28).
(3) Past 11-year period.
(4) Past 10-year period.
(5) Past 13-year period.

Table 3.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
🎯	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Good health and well-being in the EU: overview and key trends

Monitoring SDG 3 in an EU context focuses on the topics healthy lives, health determinants, causes of death and access to healthcare. As shown in Table 3.1, the EU has made significant progress in almost all health-related spheres analysed in this chapter over the past few years. However, slightly unfavourable trends have occurred in self-perceived health and in road transport deaths.

The European Commission conducts the State of Health in the EU ([2]) initiative in close collaboration with the OECD and the European Observatory on Health Systems and Policies. The recurring, two-year cycle of monitoring comprises the Health at a Glance: Europe series, Country Health Profiles for each EU Member State and a Companion Report with the European Commission's own assessment of policy levers and priorities.

Healthy lives

Over the past century, people around the world have generally been enjoying increasing lifespans. This surge in life expectancy is a result of various factors, including reductions in infant mortality, rising living standards, improved lifestyles and better education, as well as advances in healthcare and medicine ([3]). Rising life expectancy is an indicator of a population's improved general health and lower mortality rates. EU countries have some of the highest life expectancy rates in the world. While life expectancy gives an objective assessment of how long people can expect to live, it does not show whether people live their lives in good health. Thus, indicators providing insights into the (subjective) well-being of individuals are complementing the information on life expectancy.

Life expectancy at birth has increased since 2011, but fewer people perceive themselves to be in good or very good health

A child born in 2016 could on average expect to live 81.0 years, which is 3.3 years longer than in 2002. In the short term, life expectancy increased by 0.8 years between 2011 and 2016. During this period, life expectancy increased in all Member States. However, it varied by 8.6 years between the different EU countries in 2016.

A child born in 2016 could on average expect to live

81.0

years

Despite the increase in life expectancy, the share of people perceiving themselves to be in good or very good health has fallen. In 2016, more than two thirds of the people in the EU judged their health as being either good or very good (67.5 %), slightly fewer than in 2011 (67.9 %). There seems

Member States have the main responsibility for their healthcare policies and for organising their healthcare systems. However, EU cohesion policy ([4]) aims to reduce disparities between EU regions, including in terms of endowment of health services. In addition, the actions under the EU climate and environmental policy ([5]) contribute to increasing health and well-being.

Although each Member State is different, their health systems all share the ultimate aim of contributing to the good health and well-being of their population. The Commission's main role is to support Member States in this aim. Further information can be found in the 2014 Commission Communication 'On effective, accessible and resilient health systems' ([6]).

to be no straightforward explanation for the developments in the last five years, which might be an indication of the complexities underlying self-perceived health.

The share of people who perceive themselves to be in good or very good health varied strongly across Member States, between 82.8 % and 43.4 % in 2016. However, caution is needed when making cross-country comparisons of perceived general health because of the subjective nature of this assessment, which can be affected by social and cultural backgrounds. In addition, older people report poor health more often than younger people. Thus, countries with a larger proportion of elderly people may have a lower proportion of people reporting good or very good health.

Women had higher live expectancies than men, but they assessed their health less often to be good or very good

Between 2002 and 2016, the life expectancy of women increased by 2.7 years, from 80.9 years to 83.6 years. In the same timespan, the life expectancy of men went up by 3.7 years, from 74.5 years to 78.2 years. Thus, men's life expectancy saw a bigger increase than that for women, indicating a closing of the life expectancy gender gap. This can at least partly be attributed to women adopting similar risk-increasing life-styles as men, such as smoking, and to a sharp reduction in deaths from cardiovascular diseases among men ([7]).

67.5 %
of the EU population perceived themselves to be in good or very good health in 2016

Although women are expected to live longer than men, they are less likely to rate their health as being very good or good. In 2016, 65.2 % of women and 70.1 % of men considered their health to be good or very good (a gender gap of 4.9 percentage points). In all Member States, except Ireland, men gave a more favourable assessment in 2016 ([8]).

Self-perceived health also shows a distinct age pattern, with fewer people in the older age groups tending to rate their health as being very good or good. Furthermore, the gender gap increases with age, peaking among people aged 75 to 84. In 2016, the gender gap was 6.0 percentage points in favour of men for people aged 75 to 84, while it only amounted to 2.8 percentage points for 16 to 64 year olds.

Finally, there are also large disparities in self-reported health between people with different income. In 2016, on average, 78.3 % of people in the highest income group reported good or very good health, while only 60.0 % of people in the lowest income group did so ([9]). The disparities may be explained by differences in living and working conditions, as well as in lifestyles ([10]). In addition, people on low incomes have less access to health services for financial or other reasons, as discussed further below.

The number of healthy life years increased for people at age 65

The Healthy Life Years (HLY) indicator is a health-expectancy indicator that combines information on mortality and morbidity. The information on health condition is collected through survey questions on self-perceived disability. With respect to the increase in life expectancy at birth, it is interesting to have a closer look at the older generations to find out whether people live longer and better or whether they only gain additional years of life in bad health. Life expectancy at age 65 is defined as the mean number of years still to be lived by a 65-year-old person, if subjected to the current mortality conditions throughout the rest of his or her life. In other words, the HLY indicator at age 65 measures the number of years that a person at age 65 is still expected to live in a self-perceived healthy condition ([11]).

In 2016, life expectancy at age 65 was estimated to be on average at 21.6 years for women and 18.2 years for men in the EU. In the same year, HLY at age 65 was on average 10.1 years for women and 9.8 years for men in the EU. Given that healthy life expectancy does not differ much between men and women aged 65, but women's overall life expectancy considerably exceeds that of men, 65-year-old women can on average be assumed

to spend a greater share of their remaining lives with a disability or a disease. More precisely, women at the age of 65 were expected to spend 46.8 % of their remaining lives free from any limitations in 2016, compared with 54.0 % of their remaining lives for men. There are also considerable differences between EU Member States. Depending on the country, women at age 65 could expect to live between 77.3 % and 21.7 % of their remaining lives free from any limitation in 2016, men between 79.1 % and 29.4 %.

Health determinants

Many factors together affect the health of individuals and populations. These include socio-economic aspects, the state of the environment, the design of our cities, opportunities of access and use of health services, and a person's individual characteristics and behaviour ([12]). The health determinants discussed in the following sections are obesity rate, smoking prevalence, noise and air pollution. Roughly speaking, the first determinants focus on a person's individual characteristics and behaviours and the second look at external factors. However, multi-dimensional aspects such as changing lifestyles, consumption patterns or mobility influence all the considered determinants.

More than half of the adult EU population was overweight in 2014

Obesity is a serious public health problem, as it significantly increases the risk of chronic diseases, such as cardiovascular disease, type-2 diabetes, hypertension and certain types of cancer. For specific individuals, obesity may further be linked to a wide range of psychological problems. For society as a whole, it has substantial direct and indirect costs that put a considerable strain on healthcare and social resources.

15.9 %
of the adult population in the EU were obese in 2014

In 2014, 15.9 % of people over the age of 18 in the EU were obese ([13]), and an additional 35.7 % were pre-obese. This means more than half of the population above the age of 18 in the EU was overweight. The share of the population that is obese generally increases with age, peaking at age 65 to 74 in 2014 and decreasing again for people at age 75 and older. While for women obesity seems to be negatively correlated with educational attainment (for example, highly-educated women tending to be less obese), there was no such clear-cut pattern for men.

In 2014, the obesity rate of EU countries ranged from 9.4 % to 26.0 % for people over the age of 18. According to the World Health Organisation (WHO), Europe had the second highest proportion of overweight or obese people in 2014, behind the Americas ([14]).

Fewer and fewer people in the EU are smoking, and the gender gap is shrinking

Tobacco consumption is considered to be 'the single largest avoidable health risk in the European Union' ([15]). Many types of cancer, cardiovascular and respiratory diseases are linked to tobacco use. Around half of all smokers die prematurely, depriving their families of income and raising the burden of healthcare.

26.0 %
of the EU population aged 15 and over were smokers in 2017

Smoking prevalence among the population aged 15 or over decreased between 2007 and 2017, from 32 % to 26 %. Nevertheless, this means that still more than a quarter of adults in the EU was smoking in 2017. More men were smoking than women in 2017 (30 % versus 22 %). However, the gender gap has slightly decreased over time, from 10 percentage points in 2007 to 8 percentage points in 2017. This development can partially explain the decreasing gender gap in life expectancy ([16]).

While smoking prevalence decreased in most EU countries over the past five years, it still varied greatly across Member States in 2017, between 7 % and 37 %. The reasons for the differences in smoking rates between EU countries are complex. A research paper from 2016 found an association

between tobacco-control policies, which include restrictions on smoking in public places or public information campaigns, and smoking cessation mostly among higher socioeconomic groups ([17]).

A new Tobacco Products Directive ([18]), adopted in February 2014, lays down rules governing the manufacture, presentation and sale of tobacco and related products. The Directive, which became applicable in EU countries on 20 May 2016, requires large mandatory combined health warnings on cigarette packages, bans all promotional and misleading elements on tobacco products, and prohibits cigarettes with characterising flavours, such as fruit or candy. From a public-health perspective, the Directive aims to protect citizens from the hazardous effects of smoking and other forms of tobacco consumption by helping them to quit or to not start smoking in the first place.

External factors affecting health, such as air pollution and exposure to noise, have on average been declining, but hotspots remain

Air pollution is the number-one environmental cause of death in Europe, responsible for more than 400 000 premature deaths per year ([19]). Air pollution can lead to or aggravate many chronic and acute respiratory and cardiovascular diseases. In addition, it reduces life satisfaction and perception of well-being. Air pollution has been one of Europe's main environmental policy concerns since the late 1970s. Air pollutants are emitted both naturally and as a result of human activities, mainly fuel combustion. Urban populations are particularly exposed to air pollution because of the high concentration of human activities and industry in EU cities and the daily flow of commuters.

In 2015, the concentration of particulate matter in atmosphere in the EU reached

14.5 µg/m³

In the EU, exposure to air pollution by fine particulate matter ($PM_{2.5}$) — one of the most harmful components of air pollution for human health ([20]) — had been increasing in urban areas until 2011. This negative trend has reversed in the short term, from 18.1 µg/m³ in 2010 to 14.5 µg/m³ in 2015, a decrease of almost 20 %. Nevertheless, substantial air pollution hotspots remain. While the annual mean for $PM_{2.5}$ is below the EU target value (25 µg/m³ annual mean), it continues to be above the level recommended by the WHO (10 µg/m³ annual mean).

In 2013 the European Commission adopted the Clean Air Policy Package ([21]) (air quality standards; national emission reduction targets; and emission standards for key sources of pollution) with a view to reducing the number of premature deaths linked to air pollution by more than half in 2030 compared with 2005. When the Directive on emissions of atmospheric pollutants ([22]), which came into force on 31 December 2016, will be fully implemented, it is expected that only one out of ten EU citizens will be exposed to concentrations above the World Health Organization's guideline value in 2030, instead of the eight out of ten in 2015.

The WHO ([23]) identified noise as the second most significant environmental cause of ill health after air pollution ([24]). Environmental noise causes approximately 16 600 cases of premature deaths per year in Europe ([25]). Road traffic is the dominant source of environmental noise; railways, airports and industry are also important sources of noise ([26]). The harmful effects of noise arise mainly from the stress reactions it causes in the human body, and these can potentially lead to premature death ([27]).

The EU has made substantial progress in this area, with the share of the population feeling affected by noise from neighbours or from the street being reduced from 23.0 % in 2007 to 17.9 % in 2016. However, because the assessment of noise pollution is a subjective measure, a fall in the value of the indicator may not necessarily indicate a similar reduction in actual noise-pollution levels.

17.9 %
of the EU population were affected by noise from neighbours or from the street in 2016

The estimated number of people exposed to levels of environmental noise in Europe that are above the noise indicator levels set by the EU Environmental Noise Directive (2002/49/EC) provides a more objective view on the matter. According to the most recent EEA assessment from 2018 ([28]), 71.7 million people in urban areas were estimated as being exposed to noise from road traffic above 55 decibel (dB) on an annual average for day, evening and night. In addition, 9.8 million people were estimated to be subjected to excessive noise from railways, 3.1 million from airports, and 1.0 million from industry.

In addition to these two major environmental factors, the exposure to and possible health impact of toxic chemicals found in the environment and food are under increasing scrutiny by the scientific and regulatory communities worldwide (see the chapter on SDG 12 'Responsible consumption and production' on page 220 and the further reading section on page 79).

Causes of death

Causes of death are among the oldest medical statistics available and play a key role in the general assessment of health in the EU. The data can be used to determine which preventive and medical curative measures or investments in research might increase a population's life expectancy. The indicators selected for this sub-theme look at deaths due to chronic and communicable diseases, as well as at fatal accidents on roads and at work. The overall trends in these areas are quite favourable, with fewer people in the EU dying due to monitored diseases and accidents.

Developments on chronic diseases and selected communicable diseases are positive, but gender gaps remain

Chronic diseases such as cardiovascular diseases, cancer, chronic respiratory diseases and diabetes are the leading cause of mortality in the EU ([29]). They are evoked or worsened by a number of risk factors, including smoking, obesity, lack of physical activity, poor diet and high alcohol consumption. In addition, air pollution and noise are also associated with premature mortality from certain chronic diseases ([30]). High mortality due to chronic diseases, combined with the fact that many cases are preventable, has led to increasing efforts to avoid lifestyle-related risk factors. Awareness initiatives on health promotion and disease prevention have been carried out at national and EU-levels. Chronic-disease

122.1
per 100 000 people died prematurely in the EU due to chronic diseases in 2015

Supporting cooperation and networking in the EU in relation to preventing and improving the response to chronic diseases is one of the priorities of the EU's Third Health Programme ([31]). The European Commission has set up an expert group, the Steering Group on Health Promotion, Disease Prevention and Management of Non-Communicable Diseases ([32]), which is the central element of the new EU approach to maximise joint efforts with the Member States on reaching the Sustainable Development Goal targets by 2030 and targets of the World Health Organization by 2025 on non-communicable diseases.

management programmes in primary care have also been implemented.

In the EU, deaths due to chronic diseases before the age of 65 fell steadily between 2002 and 2015. While there were 164.4 deaths per 100 000 people under the age of 65 due to chronic diseases in 2002, this rate had fallen by more than 25 % to 122.1 in 2015.

Communicable diseases such as HIV, tuberculosis and hepatitis are highlighted as targets in the Sustainable Development Goals. The EU has also committed to eliminating tuberculosis and HIV by 2020 and reducing hepatitis ([33]). In the EU, deaths due to these three communicable diseases fell rather steadily between 2002 and 2015: while 4.8 out of 100 000 people died as a result of one of them in 2002, this was down to 2.9 per 100 000 people by 2015.

However, while the number of deaths due to HIV, tuberculosis and hepatitis is decreasing, deaths due to other infectious and parasitic diseases are on the rise in the EU. Overall, deaths due to communicable diseases were increasing in the short and long term. In 2002, 13.8 out of 100 000 people died because of certain infectious and parasitic diseases. This number went up to 15.0 in 2010 and reached 17.4 in 2015.

There is a gender gap for both chronic and communicable diseases. The death rates were higher for men than for women, overall in the EU as well as in almost all Member States. This can partially explain the gender gap in the life expectancy indicator.

17.4
per 100 000 people died because of HIV, tuberculosis and hepatitis in the EU in 2015

With regard to communicable diseases, differences in the immune responses of the two sexes contribute to the gender gap ([36]). Exposure and behaviour may also explain certain gender differences. For example, substantially more than three quarters of HIV cases were among men. The predominant mode of transmission of HIV was through men having sex with men, followed by heterosexual intercourse ([37]).

With regard to the gender difference in chronic diseases, there are a number of explanations. First, in all countries, death rates for ischemic heart diseases (IHD) are much higher for men than for women ([38]). The IHD mortality rates have declined in all countries since 2000, due to reductions in tobacco use and improved medical care ([39]). Second, cancer mortality rates are also higher for men than for women, also in all countries ([40]). This gap can be explained partly by men being more exposed to risk factors, as well as the reduced availability or use of screening programmes for cancers affecting men ([41]). Finally, in most countries, more men than women die from respiratory diseases ([42]), which is partly due to higher smoking rates among men ([43]).

The Commission supports Member States and civil-society organisations in combatting communicable diseases through joint actions and action plans in the EU and its neighbouring countries. Decision No 1082/2013/EU ([34]) on serious cross-border threats to health lays down rules on the data and information that national competent authorities should communicate and provides for continued coordination of the network by the European Centre for Disease Prevention and Control (ECDC). An overview of the current situation, policy instruments and good practices on combatting HIV/AIDS, viral hepatitis and tuberculosis in the European Union and neighbouring countries is compiled in a 2018 Commission Staff Working Document ([35]).

Fewer people are killed in accidents at work or on roads, but progress has stalled in the past few years

Accidents were one of the most common causes of death within the EU, leading to almost 162 000 deaths or 3.1 % of all deaths in 2015 ([44]). These accidents may happen at different places such as

home, leisure venue, transport or workplace. Improving the working environment to protect workers' health and safety is recognised as an important objective by the EU and its Member States in the Treaty on the Functioning of the European Union ([45]).

25 651
people were killed in road accidents in the EU in 2016

Halving the number of deaths from road-traffic accidents is not only a global goal, but also a goal of EU policies ([46]). Road safety was made a priority of the EU common transport policy in 2001, in response to the growing concern shown by European citizens ([47]). In 2016, some 25 651 people were killed in road accidents, which is 53.3 % fewer than in 2001 and 16.4 % down from 2011. Nevertheless, the stagnation in road casualties since 2013 has put the EU off track from reaching its target of halving the number of people killed in road accidents by 2020 compared with 2010.

1.52
per 100 000 people employed had fatal accidents at work in the EU in 2016

Fatal accidents also occur at work, meaning accidents during the course of work that lead to the death of the victim within one year. The EU made progress between 2011 and 2016, reducing the number of fatal accidents at work per 100 000 employed persons from 2.05 to 1.52. Non-fatal accidents can also cause considerable harm, for example by forcing people to live with a permanent disability, leave the labour market or change job. These happened considerably more often than fatal accidents, with an incidence rate of 1 402.85 per 100 000 employed persons in 2016 ([48]).

Access to health care

2.5 %
of the EU population reported unmet need for medical care in 2016

Achieving universal health coverage is a fundamental objective for the EU, and all European countries endorse equity of access to healthcare for all people as an important policy objective ([49]). A decrease in self-perceived unmet healthcare needs would result in better health status for the affected population, particularly for low-income groups ([50]). This would reduce health inequalities, which in turn would contribute to higher economic and social cohesion.

Only few people report unmet need for medical care and the share is further decreasing

In 2016, 2.5 % of the EU population reported an unmet need for medical care because of financial reasons, long waiting lists or the distance to travel. This share was lower than five years earlier (3.4 %). However, in ten countries the proportion of the population facing unmet needs for medical care

Universal health coverage is an objective of the EU Charter of Fundamental Rights ([51]). One of the three priorities of the EU's health policy is increasing accessibility to healthcare. Further information can be found in the 2014 Commission Communication 'On effective, accessible and resilient health systems' ([52]).

In addition, one of the 20 principles of the European Pillar of Social Rights ([53]) is that everyone has the right to timely access to affordable, preventive and curative healthcare of good quality.

Finally, the Commission is co-funding a three-year joint action on health inequalities (JAHEE) with Member States, launched in 2018. One work package is dedicated to access to healthcare to those left behind.

increased between 2011 and 2016, indicating that access to healthcare remains a challenge, in particular for low-income households.

The trend in reported unmet needs was not uniform over time, with unmet needs for medical care actually increasing between 2009 and 2014. This might have been caused by reduced financial resources for the healthcare system due to the economic crisis ([54]). While there are still unanswered questions about the mechanism leading to a rise in unmet needs, several studies suggest that reasons include changes in entitlement to free healthcare coverage, higher user charges, the de-listing of some publicly financed benefits, large and sustained cuts in public spending on health, the closure of facilities and reduced opening hours ([55]). In addition, non-health system factors such as rising unemployment and reduced incomes are also highly likely to have played a part ([56]).

Financial constraints are the most common reason why people would report unmet needs for medical examination. For 1.6 % of the total population in 2016, 'too expensive' was the most prominent reason for reporting unmet medical examination. A further 0.8 % of people reported unmet medical examination because of 'waiting lists', and another 0.1 % because it was 'too far to travel'. It is worth noting that costs were not the main issue across all Member States; in 11 countries, the majority of people reporting unmet medical examination named long waiting lists as the main reason.

With costs being on average the most important reason for unmet needs, people's income obviously has a distinct impact on the accessibility of medical care. In 2016, only 1.1 % of people from the highest income group ([57]) in the EU reported unmet needs for medical examination due to one of the three reasons mentioned above. In contrast, about 4.5 times as many people (5.0 %) from the lowest income group ([58]) reported unmet needs for medical examination. Differences between other disadvantaged groups also exist. In 2016, more women, older people and people with low education levels reported unmet needs for medical examination than men, younger people and people with higher education levels.

Presentation of the main indicators

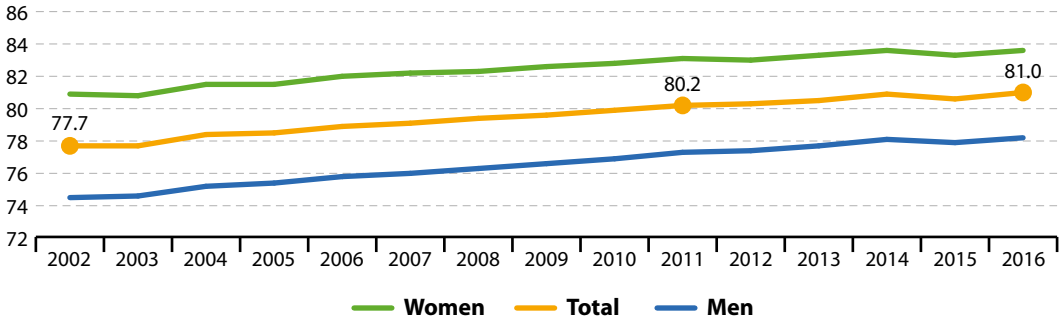
Life expectancy at birth

LONG TERM 2002–2016

SHORT TERM 2011–2016

Life expectancy at birth is defined as the mean number of years that a newborn child can expect to live if subjected throughout his life to the current mortality conditions (age-specific probabilities of dying). It is a conventional measure of a population's general health and overall mortality level.

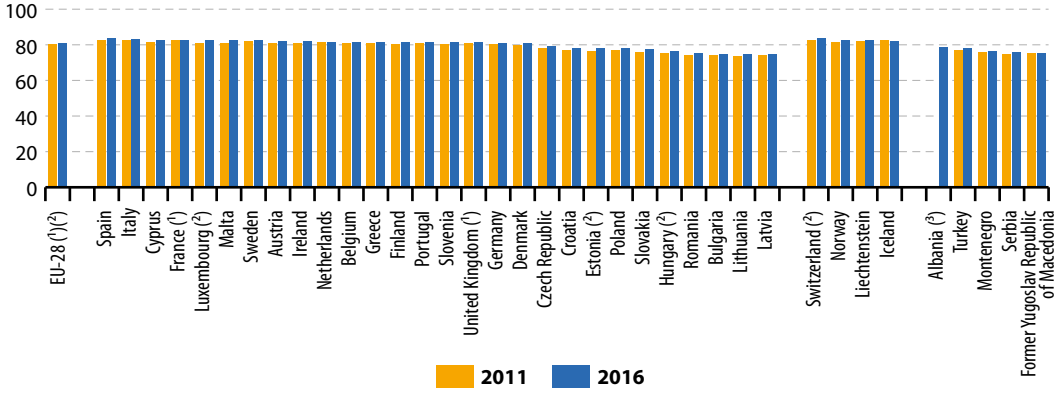
Figure 3.1: Life expectancy at birth, by sex, EU-28, 2002–2016
(years)



Note: Breaks in time series in 2010, 2011, 2012 and 2015; 2013–2016 data are provisional and/or estimates.
Source: Eurostat (online data code: sdg_03_10)

As shown in Figure 3.1, life expectancy has on average increased steadily since 2002, with the exception of a slight decline between 2014 and 2015. Between 2002 and 2016, the indicator increased by 0.3 % per year. In the short term, the increase was around 0.2 % per year.

Figure 3.2: Life expectancy at birth, by country, 2011 and 2016
(years)



(1) 2016 data are estimates or provisional.
(2) Break(s) in time series between 2011 and 2016.
(3) No data for 2011.

Source: Eurostat (online data code: sdg_03_10)

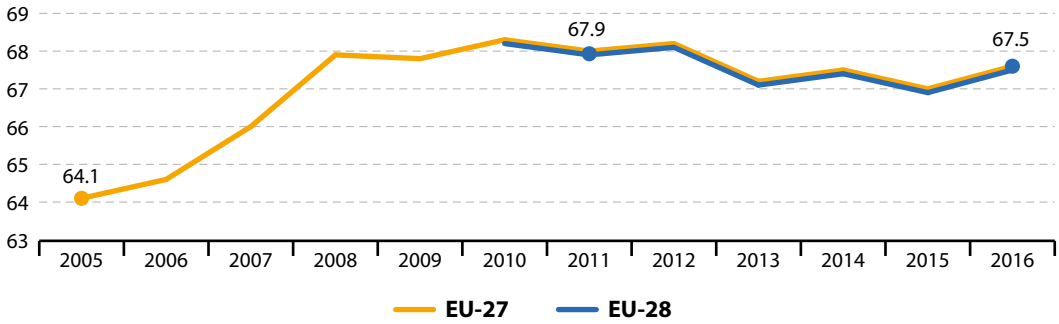
LONG TERM 2005–2016

SHORT TERM 2011–2016

Share of people with good or very good perceived health

The indicator is a subjective measure on how people judge their health in general on a scale from 'very good' to 'very bad'. The data stem from the EU Statistics on Income and Living Conditions (EU-SILC). Indicators of perceived general health have been found to be a good predictor of people's future healthcare use and mortality.

Figure 3.3: People perceiving themselves to be in good or very good health, EU-27 and EU-28, 2005–2016
(% of population aged 16 or over)

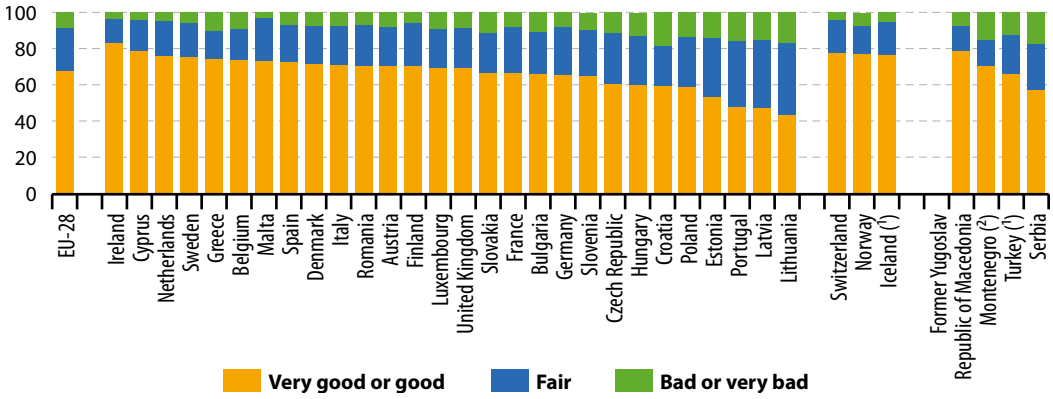


Note: 2005 and 2006 data refer to EU-25.

Source: Eurostat (online data code: sdg_03_20)

Figure 3.3 indicates that people in the EU generally rate their health quite positively. Between 2005 and 2016, the share of people perceiving themselves in good or very good health increased by 0.5 % per year on average. However, the rate slightly decreased in the short term from 2011 to 2016, by 0.1 % per year on average.

Figure 3.4: Self-perceived health by level of perception, by country, 2016
(% of population aged 16 over)



(1) 2015 data. (2) 2014 data.

Source: Eurostat (online data code: sdg_03_20)

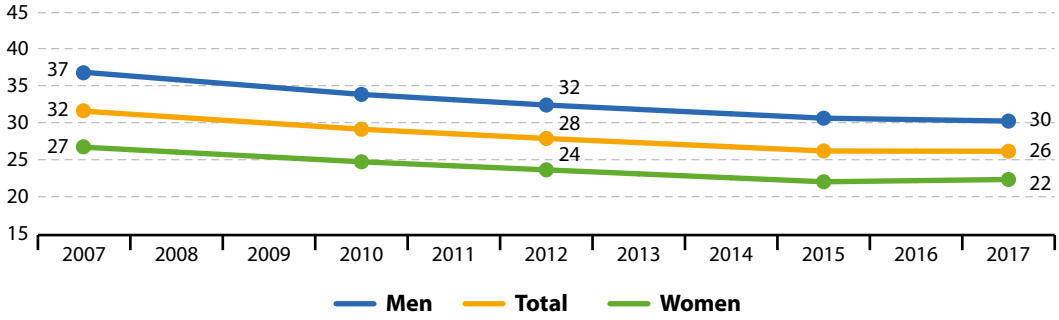
Smoking prevalence

LONG TERM 2007–2017

SHORT TERM 2012–2017

The indicator measures the percentage of the population aged 15 years and over who report that they currently smoke boxed cigarettes, cigars, cigarillos or a pipe ([59]). It does not include use of other tobacco products such as electronic cigarettes and snuff. The data are collected through a Eurobarometer survey and are based on self-reports during face-to-face interviews in people's homes.

Figure 3.5: Smoking prevalence, by sex, EU-28, 2007–2017
(% of population aged 15 or over)

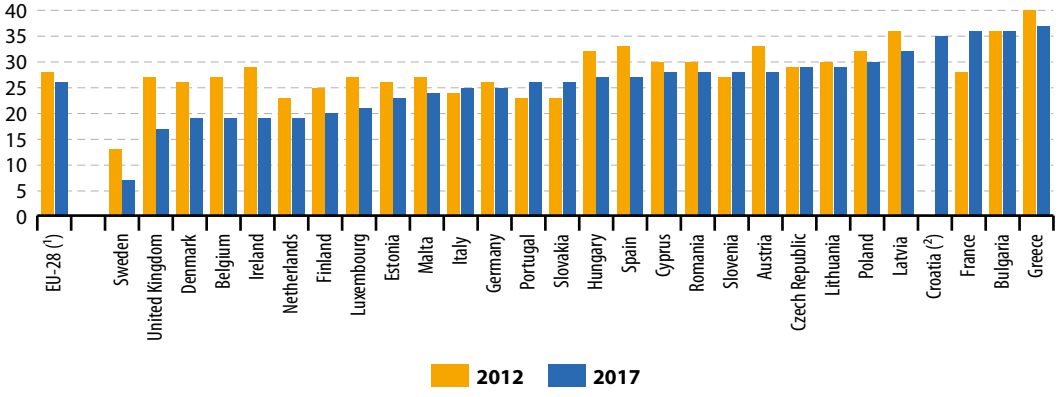


Note: Data were collected in 2007, 2010, 2012, 2015 and 2017 only; values for 2008, 2009, 2011, 2013, 2014 and 2016 are interpolated; 2007 data refer to EU-25, 2010 and 2012 data to EU-27.

Source: European Commission services (online data code: sdg_03_30)

As shown in Figure 3.5, smoking prevalence among the population aged 15 and over on average decreased by 1.9 % per year between 2007 and 2017. In the short term since 2012, the decrease has amounted to 1.3 % per year.

Figure 3.6: Smoking prevalence, by country, 2012 and 2017
(% of population aged 15 or over)



(1) 2012 data refer to EU-27.
(2) No data for 2012.

Source: European Commission services (online data code: sdg_03_30)

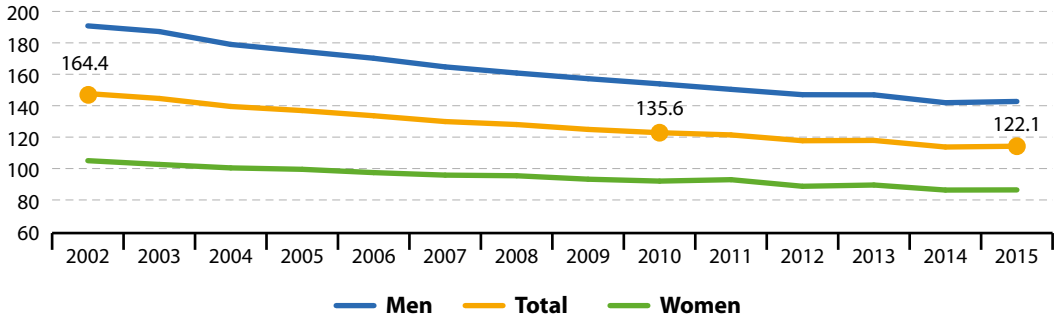
LONG TERM 2002–2015

SHORT TERM 2010–2015

Death rate due to chronic diseases

The indicator measures the standardised death rate of chronic diseases. Deaths due to chronic diseases are considered premature if they occur before the age of 65. The rate is calculated by dividing the number of people under 65 dying due to a chronic disease by the total population under 65. This value is then weighted with the European Standard Population ([60]). Chronic diseases included in the indicator are malignant neoplasms, diabetes mellitus, ischemic heart diseases, cerebrovascular diseases, chronic lower respiratory diseases and chronic liver diseases.

Figure 3.7: Death rate due to chronic diseases, EU-28, 2002–2015
(number per 100 000 persons aged less than 65)

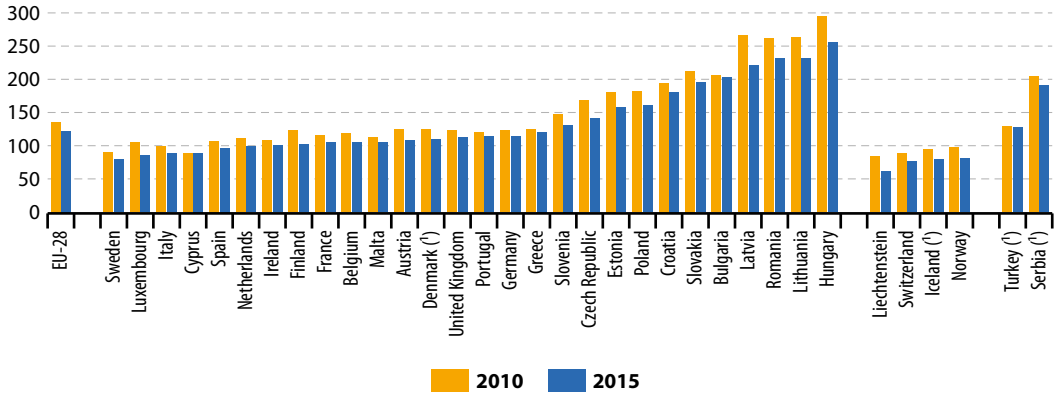


Note: Data for 2002, 2004, 2005 and 2010 are provisional.

Source: Eurostat (online data code: sdg_03_40)

As indicated in Figure 3.7, the rate of deaths due to chronic diseases decreased by an average of 2.3 % per year between 2002 and 2015. The decrease was slightly less pronounced in the short term, with a decline of 2.1 % per year.

Figure 3.8: Death rate due to chronic diseases, by country, 2010 and 2015
(number per 100 000 persons aged less than 65)



(1) 2011 data (instead of 2010).

Source: Eurostat (online data code: sdg_03_40)

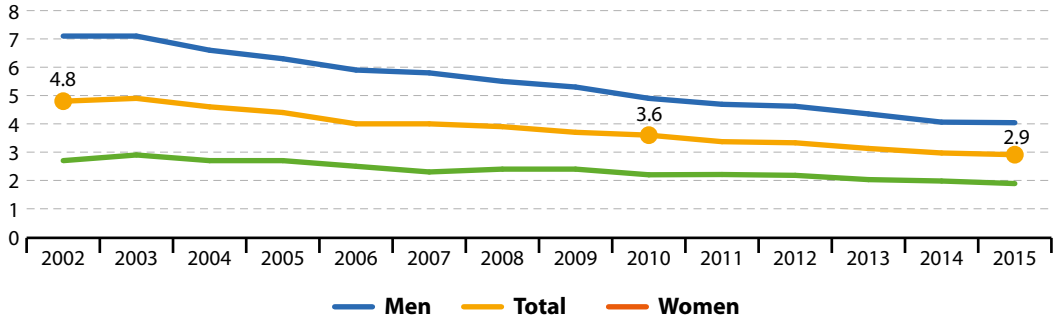
Death rate due to tuberculosis, HIV and hepatitis

LONG TERM 2002–2015

SHORT TERM 2010–2015

The indicator measures the standardised death rate of selected communicable diseases. The rate is calculated by dividing the number of people dying due to tuberculosis, HIV and hepatitis by the total population. This value is then weighted with the European Standard Population ([61]).

Figure 3.9: Death rate due to tuberculosis, HIV and hepatitis, by gender, EU-28, 2002–2015
(number per 100 000 persons)

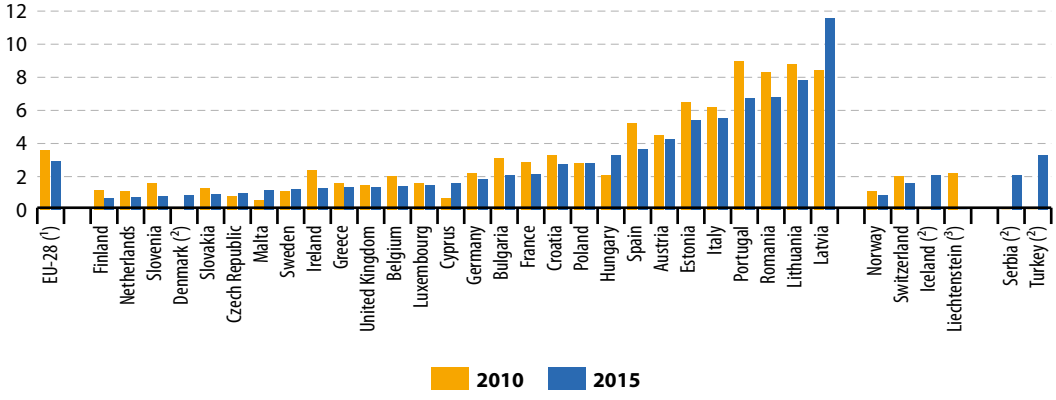


Note: Data for 2002, 2004, 2005, 2010 are provisional.

Source: Eurostat (online data code: sdg_03_41)

Deaths due to tuberculosis, HIV and hepatitis have fallen almost continuously since 2002, as shown in Figure 3.9. On average, the rate fell by 3.8 % per year between 2002 and 2015. The decrease was more pronounced in the short term, with a decline of 4.2 % per year.

Figure 3.10: Death rate due to tuberculosis, HIV and hepatitis, by country, 2010 and 2015
(number per 100 000 persons)



(1) 2010 data are provisional.
(2) No data for 2010.
(3) No data for 2015.

Source: Eurostat (online data code: sdg_03_41)

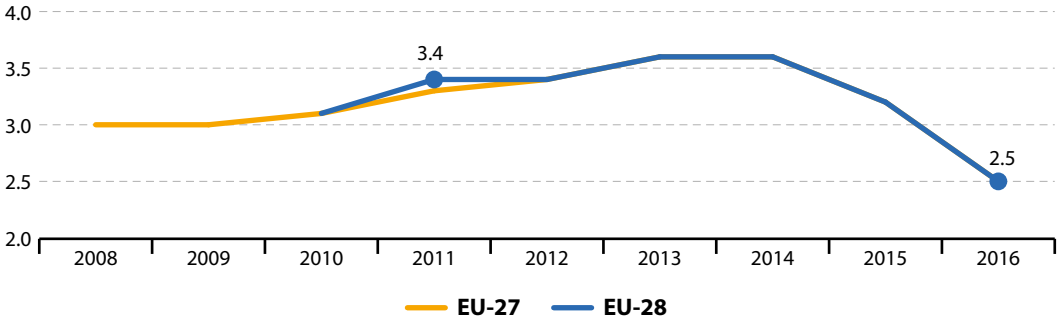
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2011–2016

Self-reported unmet need for medical care

The indicator measures the share of the population aged 16 and over reporting unmet needs for medical care due to one of the following reasons: 'financial reasons', 'waiting list' and 'too far to travel'. Self-reported unmet needs concern a person's own assessment of whether he or she needed medical examination or treatment (dental care excluded), but did not have it or did not seek it. The data stem from the EU Statistics on Income and Living Conditions (EU SILC). Since social norms and expectations may affect responses to questions about unmet care needs, caution is required when comparing differences in the reporting of unmet medical examination across countries ([62]). In addition, the different organisation of healthcare services is another factor to consider when analysing the data.

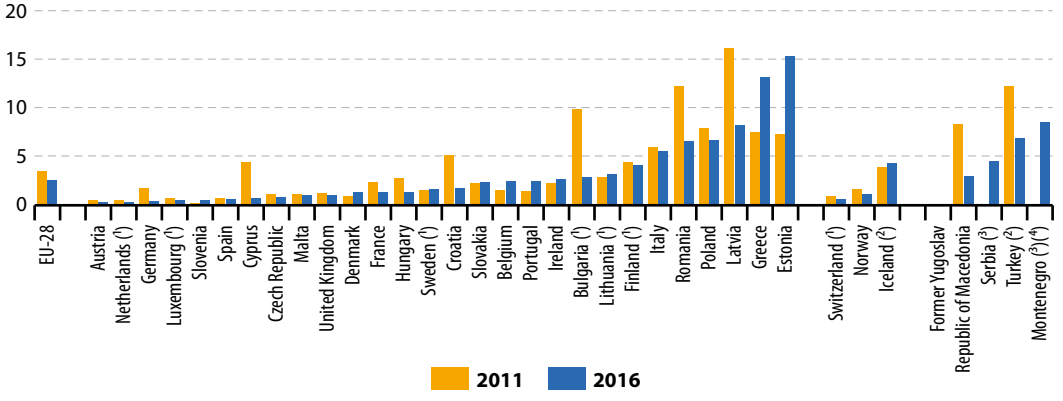
Figure 3.11: Self-reported unmet need for medical care, EU-27 and EU-28, 2008–2016
(% of population aged 16 and over)



Source: Eurostat (online data code: sdg_03_60)

As indicated in Figure 3.11, most people in the EU do not report unmet medical care needs. In addition, the share of people reporting such needs fell by 6.0 % per year on average between 2011 and 2016.

Figure 3.12: Self-reported unmet need for medical care, by country, 2011 and 2016
(% of population aged 16 and over)



(1) Break(s) in time series between 2011 and 2016.
(2) 2015 data (instead of 2016).
(3) No data for 2011.
(4) 2014 data (instead of 2016).

Source: Eurostat (online data code: sdg_03_60)

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(1) World Health Organization (1946), *Constitution of the World Health Organization*.
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(4) European Commission, *EU Regional Policy*.
(5) European Commission, *Energy, Climate change, Environment*.
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(7) OECD/EU (2014), *Health at a Glance: Europe 2014*, Paris, OECD Publishing, p. 16.
(8) A study on Spain shows that being a woman with complete dedication to domestic work is associated with a worse state of self-perceived health. See: Pino-Domínguez, Lara, Patricia Navarro-Gil, Abel E. González-Vélez, Maria-Eugenia Prieto-Flores, Alba Ayala, Fermina Rojo-Pérez, Gloria Fernández-Mayoralas, Pablo Martínez-Martín & Maria João Forjaz (2016), Self-perceived health status, gender, and work status, *Journal of Women & Aging*, 28:5, 386–394.
In addition, another study on Spain shows that the gender difference is only statistically significant in the group of people with lower educational level. See: Pinillos-Franco S, García-Prieto C (2017), *The gender gap in self-rated health and education in Spain, A multilevel analysis*, PLoS ONE 12(12).
(9) For the highest income group, the fifth income quintile is considered (the 20 % of the population with the highest income). For the lowest income group, the first income quintile group is considered (the 20 % of the population with the lowest income).
(10) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, Paris, OECD Publishing, p. 72.
(11) The data required for HLY are the age-specific prevalence (proportions) of the population in healthy and unhealthy conditions and age-specific mortality information. A healthy condition is defined by the absence of limitations in functioning/disability. The indicator is calculated separately for males and females. The indicator is also called disability-free life expectancy (DFLE).
(12) WHO (2017), *The determinants of health, Introduction*.
(13) The indicator measures the share of obese people based on their body mass index (BMI). BMI is defined as the weight in kilos divided by the square of the height in metres. People aged 18 years or over are considered obese with a BMI equal or greater than 30. Other categories are: underweight (BMI less than 18.5), normal weight (BMI between 18.5 and less than 25), and pre-obese (BMI between 25 and less than 30). The category overweight (BMI equal or greater than 25) combines the two categories pre-obese and obese.
(14) Eurostat (2014), *Statistics explained: Overweight and obesity — BMI statistics*.
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(16) OECD/EU (2014), *Health at a Glance: Europe 2014*, Paris, OECD Publishing, p. 16–17.
(17) Bosdriesz, J.R, et al. (2016), Tobacco control policy and socio-economic inequalities in smoking in 27 European countries, Drug & Alcohol Dependence, Vol. 165, p. 79.
(18) European Parliament and Council of the European Union (2014), Directive 2014/40/EU on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and sale of tobacco and related products and repealing Directive 2001/37/EC.
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(20) World Health Organization (2016), *World Health Statistics 2016: Monitoring Health for the SDGs*, p. 37.
(21) European Commission, Clean Air Programme.
(22) European Parliament and Council of the European Union (2016), Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC.
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(24) European Environment Organisation (2017), *Environmental noise*.
(25) European Environment Organisation (2017), *Environmental noise*. The estimates cover the 28 EU Member States as well as the five member countries of the European Environment Agency (Iceland, Liechtenstein, Norway, Switzerland and Turkey).
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(27) Ibid.
(28) European Environment Organisation (2018), *Population exposure to environmental noise*.
(29) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, Paris, OECD Publishing.
(30) European Environment Organisation (2017), *Environmental noise*; European Environment Organisation (2017), *Air quality in Europe — 2017 report*, EEA Report No 13/2017, Copenhagen, EEA, p. 50 and 55.
(31) European Parliament and Council of the European Union (2014), Regulation (EU) No 282/2014 on the establishment of a third Programme for the Union's action in the field of health (2014–2020) and repealing Decision No 1350/2007/EC.
(32) European Commission, Steering Group on Health Promotion, Disease Prevention and Management of Non-Communicable Diseases.

(33) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, Communication of 22 November 2016 from the Commission to the European Parliament, the Council, the European and Social Committee and the Committee of the Regions, COM(2016) 739 final, Strasbourg.
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(35) European Commission (2018), *Commission Staff Working Document on Combatting HIV/AIDS, viral hepatitis and tuberculosis in the European Union and neighbouring countries — State of play, policy instruments and good practices*, SWD(2018) 387 final, Brussels.
(36) J. van Lunzen and M. Altfeld (2014), Sex Differences in Infectious Diseases — Common but Neglected, *The Journal of Infectious Diseases*, Volume 209, Issue suppl_3, 15 July 2014, p. S79-S80.
(37) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, Paris, OECD Publishing, p. 76.
(38) Id., p. 62.
(39) Ibid.
(40) Id., p. 64.
(41) Ibid.
(42) Id., p. 66.
(43) Ibid.
(44) Source: Eurostat (online data code: hlth_cd_aro).
(45) Treaty on the Functioning of the European Union, Article 153.
(46) European commission (2010), Commission outlines measures to halve road deaths by 2020. Between 2000 and 2010, the total road death number was cut by 44 %. The target of halving the 2000 number was reached in 2012. The Commission adopted a follow-up target of cutting road death in Europe by half between 2010 and 2020.
(47) European Commission (2001), *White Paper on European transport policy for 2010: time to decide*, COM(2001) 370 final, p. 64.
(48) Source: Eurostat (online data code: hsw_n2_01).
(49) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, Paris, OECD Publishing, p. 154.
(50) Ibid.
(51) European Commission, European Parliament and Council of the European Union (2000), *Charter of Fundamental Rights of the European Union (2000/C 364/01)*.
(52) European Commission (2014), *Communication from the Commission on effective, accessible and resilient health systems*, COM(2014) 215 final, Brussels.
(53) European Commission (2017), *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels.
(54) Expert Panel on effective ways of investing in health (EXPH) (2016), *Access to health services in the European Union, final opinion approved at the 14th plenary meeting of 3 May 2016 after public consultation*, p. 18.
(55) Id., p. 19.
(56) Ibid.
(57) For the highest income group, the fifth income quintile is considered (the 20 % of the population with the highest income).
(58) For the lowest income group, the first income quintile group is considered (the 20 % of the population with the lowest income).
(59) European Commission (2017), *Attitudes of Europeans towards tobacco and electronic cigarettes*, Special Eurobarometer 458, Annex.
(60) Standardised death rates take into account the fact that countries with larger shares of older inhabitants also have higher death rates. See also: Eurostat (2013), *Revision of the European Standard Population*, Report for Eurostat's Task Force, Luxembourg, Publications Office of the European Union.
(61) Ibid.
(62) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, Paris, OECD Publishing, p. 154.

4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 4 seeks to ensure access to equitable and quality education through all stages of life as well as to increase the number of young people and adults having relevant skills for employment, decent jobs and entrepreneurship. The goal also envisages the elimination of gender and income disparities in access to education.

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Education and training are key drivers for growth and jobs as they help to improve employability, productivity, innovation and competitiveness. In the broader sense, education is also a pre-condition for achieving many other Sustainable Development Goals. Receiving quality education enables people to break the cycle of poverty. Education therefore helps to reduce inequalities and to reach gender equality. It also empowers people to live healthier lives and helps them to adopt a more sustainable lifestyle. Furthermore, education is crucial for fostering tolerance and contributes to more peaceful societies. Education and Training 2020 (ET 2020) (1) is the strategic framework for European cooperation in education and training. It takes into consideration the whole spectrum of education and training systems from a lifelong learning perspective, covering all levels, from basic education to tertiary and adult education. ET 2020 defines several benchmarks that guide the analysis in this chapter.

Table 4.1: Indicators measuring progress towards SDG 4, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Basic education			
Early leavers from education and training	↑	↑	page 91
Participation in early childhood education	↑	↑	page 92
Underachievement in reading, maths and science	↘ (1)	↓ (2)	page 93
Young people neither in employment nor in education and training (*)	↑	↑	SDG 8 , page 161
Tertiary education			
Tertiary educational attainment	↑	↑	page 94
Employment rate of recent graduates	↗ (3)	↑	page 95
Adult education			
Adult participation in learning	↗	↘ (4)	page 96

(*) Multi-purpose indicator.
(1) Trend for 'reading performance' only.
(2) Past 6-year period
(3) Past 11-year period.
(4) Past 4-year period.

Table 4.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Quality education in the EU: overview and key trends

Monitoring SDG 4 in an EU context focuses on the topics basic education, tertiary education and adult education. As Table 4.1 indicates, the EU has made a significant progress in increasing participation in basic and tertiary education. However, over the past few years, progress in adult education has been much slower, and the performance of EU pupils in the PISA test has further deteriorated.

Basic education

Basic education covers the earliest stages in children's educational pathway, ranging from early childhood education to primary and secondary education. An inclusive and quality education for all that eliminates school segregation is an essential element of sustainable development. SDG 4 calls not only for all girls and boys to have access to primary and secondary education, but also to be able to complete their schooling, because leaving school early has a big impact on people's lives. People with low levels of education may face greater difficulties in the labour market and are more likely to live in poverty and social exclusion ([2]). Furthermore, SDG 4 focuses on granting greater and more equitable access to education and training and ensuring its high quality. An important objective of this goal is that education systems deliver high levels of numeracy and literacy and enable other basic skills to be acquired. The indicators selected for monitoring these topics show that while participation rates in basic education have improved across the EU over the past few years, learning outcomes have developed less favourably.

Education and training 2020 (ET 2020) ([3]) is the strategic framework for European cooperation in education and training. It is a forum for exchanging best practices, mutual learning, gathering and disseminating information and evidence of what works, as well as advice and support for policy reforms. The framework takes into consideration the whole spectrum of education and training systems from a lifelong perspective, covering all levels and contexts (including non-formal and informal learning). ET 2020 defines several benchmarks that guide the analysis of this chapter.

Participation in early childhood education has reached the ET 2020 benchmark

Early childhood education and care (ECEC) is usually the first step in children's educational pathways. Quality ECEC provides an essential foundation for future educational achievements and effective adult learning. It also lays the foundations for later success in life in terms of well-being, employability and social integration, especially for children from disadvantaged backgrounds. Investment in pre-primary education also has a beneficial medium- to long-term impact, as it is more likely to help children from low socio-economic backgrounds than investment at later educational stages ([4]). As a consequence, the ET 2020 framework has set a benchmark at EU level (there are no national targets) to ensure that at least 95 % of children aged between four and the starting age of compulsory education participate in ECEC. In the EU, participation in early childhood education has steadily increased since 2003, and the ET 2020 benchmark of 95 % had already been reached in 2016, with a rate of 95.5 %, although cross-country differences persist.

95.5 %
of young children in the EU participated in early childhood education and care in 2016

Significant reduction in early leaving from education and training since 2002

In 2017, the share of 18 to 24 year olds in the EU who had left education and training early amounted to

10.6 %

The EU has defined upper secondary education as the minimum desirable educational attainment level for EU citizens. The skills and competences gained in upper secondary education are considered essential for successful entry into the labour market and as the foundation of a lifelong learning. The share of early leavers from education and training has fallen continuously since 2002, albeit more slowly in recent years. The reduction from 17.0 % in 2002 to 10.6 % in 2017 represents a clearly favourable progress towards the ET 2020 benchmark of 10 %.

Across the EU, the European Social Fund ([5]) is financing initiatives to improve education and training, and ensure young people complete their education and get the skills that make them more competitive on the job market. Reducing early school leaving is a major priority here, along with improving vocational and tertiary education opportunities.

Despite improved participation rates, education outcomes in reading, maths and science have deteriorated

Besides educational attainment in general, achieving a certain level of proficiency in basic skills is a key objective of all educational systems. Basic skills, such as reading a simple text or performing simple calculations, provide the foundations for learning, gaining specialised skills and personal development. People need these skills to complete basic tasks and to participate fully in and contribute to society. The consequences of underachievement, if it is not tackled successfully, will be costly in the long run, both for the individuals and for society as a whole ([6]). Various factors contribute to underachievement, such as an unfavourable school climate, violence in schools, insufficient learning support or poor teacher-pupil relationships.

19.7 %

of 15 year old pupils in the EU showed insufficient reading skills in 2015

The indicator on underachievement in reading, maths and science provides key insights into the performance of school systems and pupils' basic skills attainment. The ET 2020 framework acknowledges the increasing importance of these individual skills and has set a target to reduce the share of 15-year-olds achieving low levels of reading, maths and science to less than 15 % by 2020. In 2015, for each of these skills, about every fifth 15-year-old pupil showed insufficient abilities. Test results were best for reading, with a 19.7 % share of low achievers, followed by science with 20.6 % and maths with 22.2 %. Compared with 2012 this is a step backward, indicating that the EU is seriously lagging behind in all three domains when it comes to reaching the 2020 benchmark.

Young women stay longer in education and training and show better reading skills

The aggregated figures presented above mask considerable gender differences in some of these areas. While there are no differences between boys and girls in ECEC, there is a significant disparity when it comes to early school leaving. With a rate of 12.1 % in 2017, more young men had left education and training early than young women, whose rate was 8.9 %. Although this gap has been narrowing since 2004, it remained substantial, at 3.2 percentage points in 2017. Gender differences can also be observed for reading skills, with girls clearly outperforming boys. While only 15.9 % of 15-year-old girls scored low in this domain in 2015, the share of low-achieving boys was 23.5 %. In contrast, gender gaps in maths and science remained negligible.

The New Skills Agenda for Europe ([7]), adopted by the Commission on 10 June 2016, launched 10 actions to make the right training, skills and support available to people in the EU. The goals and actions on the Agenda are set out in the Commission Communication: A New Skills Agenda for Europe ([8]).

Young people with disabilities or from a migrant background show significantly lower educational attainment

People with disabilities — those who are limited in work activity because of a long-standing health problem or a basic activity difficulty (such as sight, hearing, walking or communicating difficulties) (LHPAD) — appear extremely disadvantaged as far as early school leaving is concerned. In 2015, 22.0 % of people with disabilities had left education and training early, compared with 11.7 % of young people without disabilities ([9]).

Also, young people from a migrant background — those either born outside the country or with foreign-born parents — face difficulties in their schooling. As far as early leaving from education and training is concerned, there is clear evidence that young people from a migrant background tend to find it more difficult to complete their education than the native population. In 2017, the share of early school leavers was twice as high for people born outside the EU than for people studying in their country of birth. Most at risk are foreign-born men, with an early leaving rate of 21.0 % in 2017 ([10]).

Young people from a migrant background also have a higher risk of performing badly at school. In almost all Member States of the EU, the difference in the share of low achievers between first-generation immigrant students and their non-immigrant counterparts was substantial in 2015, in some countries, amounting to as much as 25 to 33 percentage points ([11]).

Early leavers and low educated young people face particularly severe problems in the labour market

13.4 %
of young people aged 15 to 29 were not employed nor in education and training in the EU in 2017

In general, young people (aged 15 to 29 years) are among the most vulnerable groups, facing low employment rates and being generally less well attached to the labour market (for example, due to temporary contracts). Yet, jobs for young people are not only important for social, economic and political inclusion. A person's lifelong earnings are influenced by his or her first job, and people with poor job prospects risk falling into 'low-pay traps'. Young people who are not engaged in employment nor in education and training (NEET) might lack skills and suffer from erosion of competences. Therefore, they are at an even higher risk of labour market and social exclusion and are more likely to depend on social benefits. In the EU, the NEET rate for 15- to 29-year-olds improved between 2002 and 2008, falling from 15.6 % to 13.0 %. It went back up due to the economic crisis, to 15.9 % in 2012, but has been falling again since 2013, reaching 13.4 % in 2017.

Early leavers and low-educated young people face particularly severe problems in the labour market. About 55.7 % of 18- to 24-year-olds with at most lower secondary education and who were not in any education or training were either unemployed or inactive in 2017. Moreover, the situation for early leavers has worsened over time. Between 2008 and 2017, the share of 18- to 24-year-old early leavers who were not employed but wanted to work grew from 30.6 % to 34.9 % ([12]).

Tertiary education

Continuing education after the basic level is important because people with higher qualifications are more likely to be employed and less likely to face poverty in a knowledge-

based economy. Therefore, investing efficiently in education and training systems that deliver high-quality and up-to-date services lays the foundation for a country's prosperity. Moreover, employment rates are generally higher for highly-educated people. Conversely, low levels of tertiary educational attainment can hinder competitiveness, innovation and productivity and undermine growth potential.

The two indicators selected for this sub-theme show that while the EU is on track to reach its target for tertiary education, it may fall short on meeting the one for placing recent graduates in the labour market.

The share of the population with tertiary education keeps growing

The ET 2020 framework aims to raise the share of the population aged 30 to 34 that has completed tertiary or equivalent education to at least 40 %. In the EU as a whole, this share has increased by 16.3 percentage points since 2002 and seems to be on track to reach the target, with a rate of 39.9 % in 2017. The share has been growing steadily since 2002 in all Member States, which — to some extent — reflects their investment in higher education to meet demand for a more skilled labour force. Moreover, some countries shifted to shorter degree programmes following the implementation of Bologna ([13]) process reforms.

39.9 %
of the EU population aged 30 to 34 had accomplished a tertiary education in 2017

The Europe 2020 strategy ([14]) was adopted as a strategy for jobs and smart, sustainable and inclusive growth. Both benchmarks on early school leaving and tertiary educational attainment are included as two of its headline targets.

Employment rates rise with educational attainment

In addition to increasing tertiary education, the ET 2020 framework acknowledges the important role of education and training in raising employability. It has set a benchmark that at least 82 % of recent graduates (20- to 34-year-olds) should have found employment no more than three years after leaving education and training. In the EU, the employment rate of recent graduates from at least upper secondary education and not in any education or training has increased steadily since 2013, reaching 80.2 % in 2017. Although the rate has not yet regained the pre-economic crisis peak of 82.1 % reached in 2008, it is on track to meeting the 2020 target of 82 % if the pace of growth recorded since 2013 continues.

Overall, employment rates rise with educational level, indicating that a person with a higher educational attainment has a comparative advantage on the labour market (see the chapter on SDG 8 'Decent work and economic growth' on page 156). In 2017, the employment rate of recent graduates with tertiary education (International standard classification of education (ISCED) 2011 levels 5–8) was 10.8 percentage points higher than for people from the same age group with only medium educational attainment (ISCED 2011 levels 3 and 4). This gap has narrowed slightly since 2011, when it amounted to 11.3 percentage points.

There is also a clear difference between the programme orientation of ISCED level 3 and 4. While the employment rate of recent graduates for the general orientation stood at 64.1 % in 2017, it was at 76.6 % for the vocational orientation in the same year, hence almost as high as for the tertiary level. Some of the difference between the lower educated cohort and the tertiary graduates may be linked to the latter deciding to take jobs for which they were over-qualified in order to get into the labour market. Thereby, they are boosting

80.2 %
of recent graduates in the EU were employed in 2017

the employment rate for tertiary graduates while at the same time lowering the rate for other graduates. This may be especially important in those cases where labour market demand is still subdued due to the economic crisis ([15]).

Women achieve higher tertiary education attainment rates, but male graduates are more likely to find employment

Despite the overall positive trend in tertiary educational attainment, the gender gap has widened significantly across the EU. While in 2002 the share of 30- to 34-year-olds with completed tertiary education had been similar for women (24.5 %) and men (22.6 %), the increase up to 2017 was almost double for women. In 2017, women had already clearly exceeded the ET 2020 benchmark, with a rate of 44.9 %. In contrast, the share among 30 to 34 year-old men was 10 percentage points lower, at 34.9 %.

On the other hand, men were more likely to find employment within three years after their graduation than their female counterparts. In 2017, the employment rate for recent male graduates (82.0 %) was higher than the rate recorded among women (78.4 %). This pattern has been apparent since 2006, but its intensity has changed over time. The largest gender gaps were recorded in 2005 and 2007. The gap shrank again significantly with the onset of the economic crisis, but widened in 2010 and remained within the 3.3 to 4.7 percentage-point range in favour of male graduates between 2010 and 2017. Some of these gender differences may be explained by the nature of the different fields typically studied by women and men (for example, a higher proportion of science and technology students tend to be male) and by differences in labour market demand for graduates with different skills ([16]).

People with disabilities find it harder to complete tertiary education. According to a study using the EU statistics on income and living conditions survey (EU-SILC), 29.4 % of people aged 30 to 34 with disabilities had completed tertiary or equivalent education in 2015. This is more than 10 percentage points lower than the rate for people without disabilities ([17]).

Foreign-born residents achieve lower tertiary attainment rates and lower recent graduate employment rates

For tertiary educational attainment there is not only a significant gender gap, but also a difference related to migrant status. In 2017, the tertiary educational attainment rate was more than four percentage points higher for native-born residents than for the foreign-born population. Within the foreign-born group, the rate was considerably lower for people from outside the EU than for those from another Member State. No clear patterns can however be observed at individual country level. While some Member States showed gaps of more than 30 percentage points between native- and foreign-born residents, others showed a reverse pattern, with the foreign-born population having higher attainment rates ([18]). This may reflect differences in migration patterns across Europe (both out- and in-flows), with some Member States attracting and retaining people with high skill levels and others attracting a lower-skilled population ([19]). The foreign-born population is also disadvantaged as far as the employment status of recent graduates is concerned. In 2017, the proportion of employed recent graduates varied between the native-born and the foreign-born population by 4.5 percentage points ([20]).

Adult education

Underpinning the ongoing quest for a high-quality labour force with up-to-date skills is one of the goals of adult learning. Adult education and training covers the longest time span in the process of learning throughout a person's life (data refer to people aged 25 to 64). It is crucial for maintaining good health, remaining active in the community and being fully included in all aspects of society. Moreover, it helps to improve and develop skills, adapt to technological developments, advance a career or return to the labour market (upskilling and reskilling).

Adult participation in learning remains far from the target set for 2020

The ET 2020 framework includes the target to increase the share of 25- to 64-year-old adults participating in learning to 15 %. In 2017, this rate stood at 10.9 %, having increased only very slowly over the four preceding years. Pronounced increases were only observable between 2002 and 2005 and from 2012 to 2013. However, this most recent growth can mainly be attributed to a methodological change in the French Labour Force Survey in 2013 ([21]).

10.9 %
of 25- to 64-year-old adults participated in learning in the EU in 2017

Due to the recent stagnation of the share of 25- to 64-year-olds participating in learning at slightly below 11 %, the EU does not seem to be on track to meet the 15 % benchmark by 2020. This is particularly worrisome in light of the results of the Programme for the International Assessment of Adult Competencies (PIAAC), which show that a significant number of EU adults struggle with literacy, numeracy and digital skills ([22]).

Adult learning is the key subject of The Council Resolution on a renewed European agenda for adult learning ([23]). The Recommendation 'Upskilling Pathways: new opportunities for adults' ([24]) aims to improve adult learning provision specifically to address the needs of low-skilled/low-qualified adults.

Available data on people's digital skills support the importance of adult learning by showing a clear relation between age and the level of digital skills. While 82 % of 16- to 24-year-olds had basic or above-basic overall digital skills in 2017, this was only the case for 65 % of 25- to 54-year-olds. In particular older people struggle with the use of digital media, with only 34 % of people aged 55 to 74 having basic or above-basic digital skills ([25]).

Women are more likely to participate in adult learning

In 2017, the share of 25- to 64-year-old women engaged in adult learning was nearly two percentage points higher than that of men (11.8 % compared with 10.0 %). The rate for women was not only clearly above the men's rate, it had also been improving faster, with gaining 4.1 percentage points since 2002 compared with 3.4 percentage points for men. Younger people are also more likely to participate in adult learning. While the participation rate of 25- to 34-year-olds stood at 17.6 % in 2017, it was much lower for 55- to 64-year-olds, at 6.3 % ([26]). There is also a difference in terms of labour status, although this is less pronounced. In 2017, 11.6 % of employed persons aged 25 to 64 participated in adult learning, whereas this was only the case for 10.1 % of unemployed people ([27]). This is especially worrisome as older people and unemployed persons are the groups who need adult learning the most in order to upskill/reskill and to reintegrate into the labour market.

There is also a clear gradient of adult participation in learning in terms of the different educational attainment levels. In 2017, adults (aged 25 to 64) with at most lower secondary education were less engaged in learning (4.3 %) than those with upper secondary (8.9 %) or tertiary education (18.6 %) ([28]).

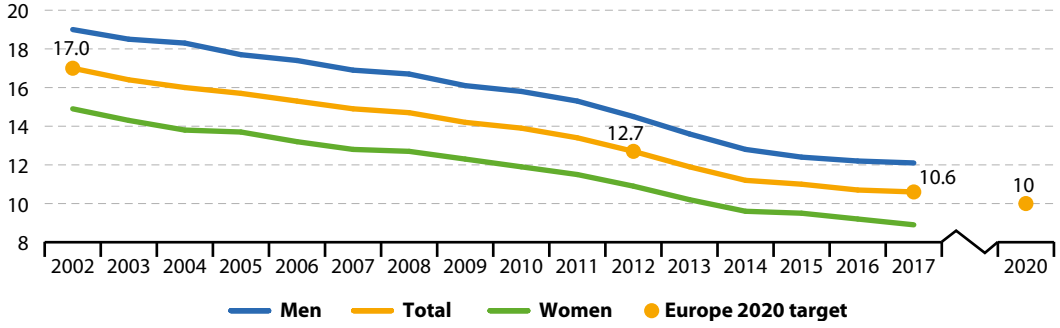
Presentation of the main indicators

Early leavers from education and training

LONG TERM 2002–2017
SHORT TERM 2012–2017
* Total ** Gender gap

The indicator measures the share of the population aged 18 to 24 with at most lower secondary education who were not involved in any education or training during the four weeks preceding the survey. The data stem from the EU Labour Force Survey (EU-LFS).

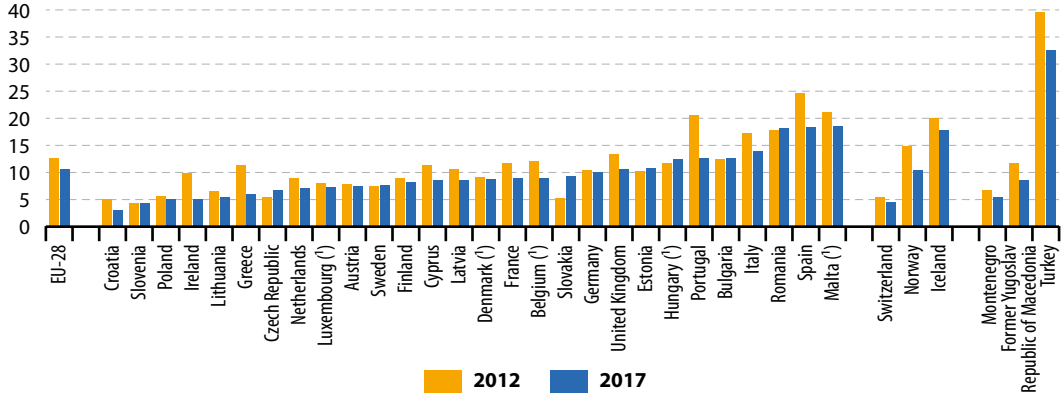
Figure 4.1: Early leavers from education and training, by sex, EU-28, 2002-2017
(% of the population aged 18 to 24)



Note: Breaks in time series in 2003, 2006 and 2014.
Source: Eurostat (online data code: sdg_04_10)

Figure 4.1 shows that the phenomenon of early school leaving is becoming less prevalent in the EU. The share of early leavers from education and training fell by 3.1 % per year on average between 2002 and 2017. In the short-term period, the average annual decrease was even stronger, at 3.6 %, which represents considerable progress towards the ET 2020 benchmark of 10 %. The gender gap has also narrowed, by an average of 1.6 % per year between 2002 and 2017 and 2.3 % between 2012 and 2017.

Figure 4.2: Early leavers from education and training, by country, 2012 and 2017
(% of the population aged 18 to 24)



Note: All countries: break in time series in 2014 (switch from ISCED 1997 to ISCED 2011); the change of ISCED has no impact on the comparability over time of this indicator for all Member States, except Estonia. (1) Break(s) in time series between 2014 and 2017.
Source: Eurostat (online data code: sdg_04_10)

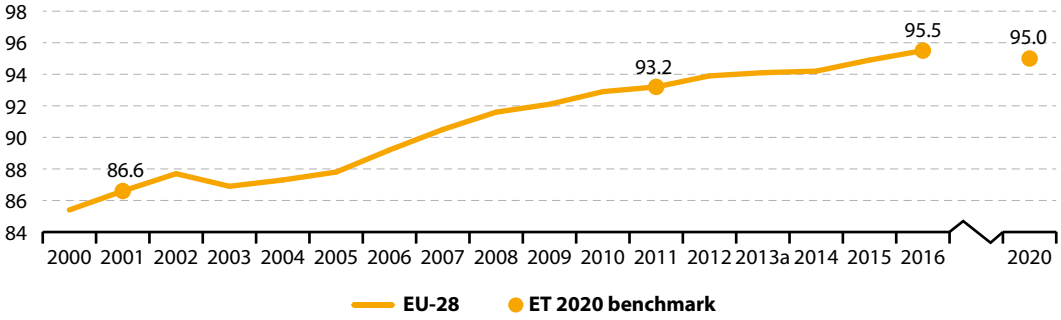
LONG TERM 2001–2016

SHORT TERM 2011–2016

Participation in early childhood education

The indicator measures the share of children between the age of four and the starting age of compulsory primary education who participated in early childhood education. Data presented here stem from the joint UIS (UNESCO Institute of Statistics)/OECD/Eurostat (UOE) questionnaires on education statistics, which constitute the core database on education.

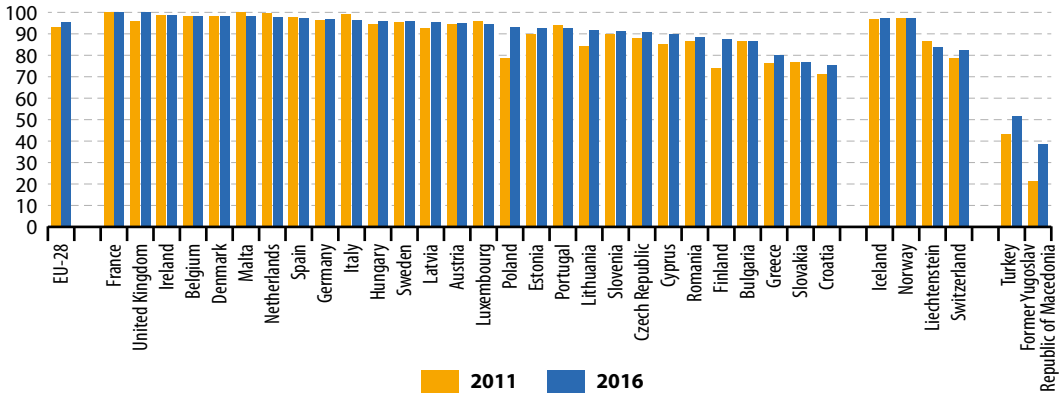
Figure 4.3: Participation in early childhood education, EU-28, 2000–2016
(% of the age group between 4-years-old and the starting age of compulsory education)



Source: Eurostat (online data code: sdg_04_30)

Figure 4.3 shows that participation in ECEC has grown more or less continuously in the EU between 2001 and 2016, by 0.7 % per year on average. The increase has been less pronounced in the short-term period since 2011, at 0.5 % on average per year, but nonetheless participation in early childhood education has already reached its target of 95 % four years in advance.

Figure 4.4: Participation in early childhood education, by country, 2011 and 2016
(% of the age group between 4-years-old and the starting age of compulsory education)



Source: Eurostat (online data code: sdg_04_30)

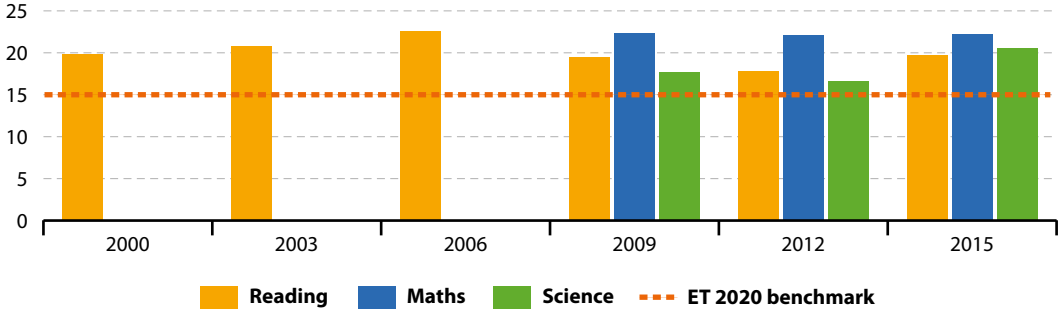
Underachievement in reading, maths and science

LONG TERM 2000–2015

SHORT TERM 2009–2015

The indicator measures the share of 15-year-old students failing to reach level 2 ('basic skills level') on the Programme for International Student Assessment (PISA) scale for the three core school subjects of reading, mathematics and science. The data stem from the PISA study, a triennial international survey that aims to evaluate education systems by testing the skills and knowledge of 15-year-old students.

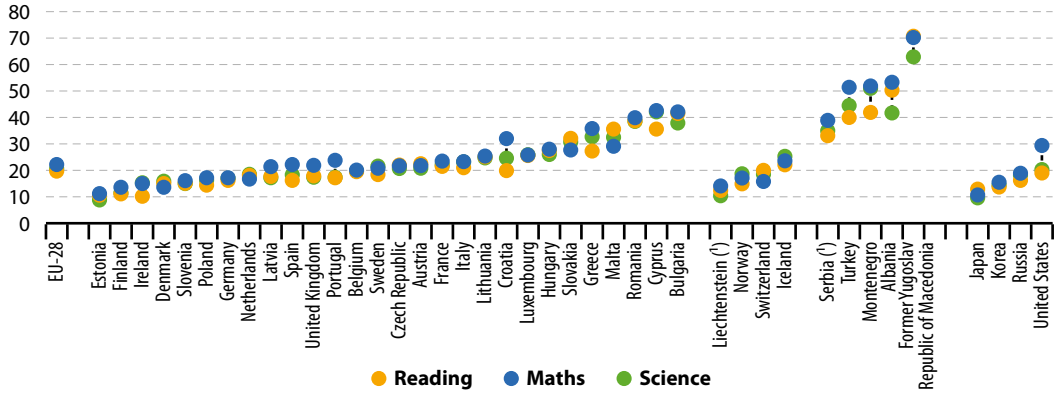
Figure 4.5: Underachievement in reading, maths and science, EU, 2000–2015
(% of 15-year-old students)



Note: Composition of EU aggregate differs for each year; 2015 data refer to EU-28.
Source: OECD/PISA (online data code: sdg_04_40)

As shown in Figure 4.5 the rate of underachievement in reading has more or less stagnated around 20 % since 2000. In the short-term period since 2009 all three domains show a stagnation or a development in the wrong direction, meaning that the EU is not on track to meeting its 2020 target of 15 %.

Figure 4.6: Underachievement in reading, maths and science, by country, 2015
(% of 15-year-old students)



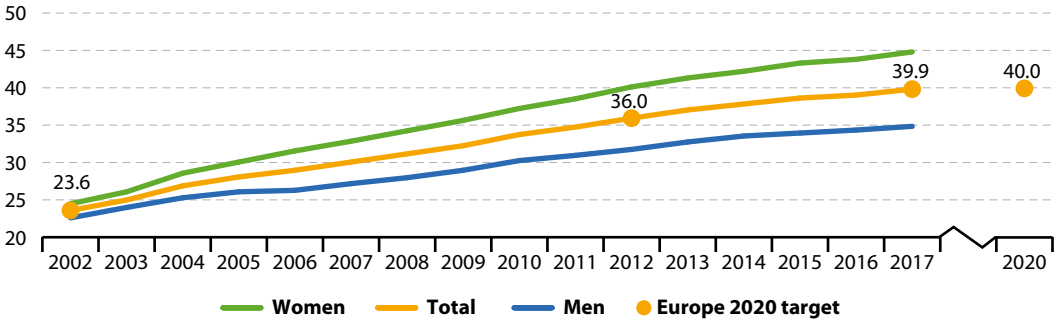
(1) 2012 data.
Source: OECD/PISA (online data code: sdg_04_40):

LONG TERM 2002–2017
SHORT TERM 2012–2017
* Total ** Gender gap

Tertiary educational attainment

The indicator measures the share of the population aged 30 to 34 who have successfully completed tertiary studies (for example, at university or a higher technical institution). Tertiary educational attainment refers to ISCED (International Standard Classification of Education) 2011 levels 5-8 for data from 2014 onwards and to ISCED 1997 levels 5-6 for data up to 2013. The indicator is based on the EU Labour Force Survey (EU-LFS).

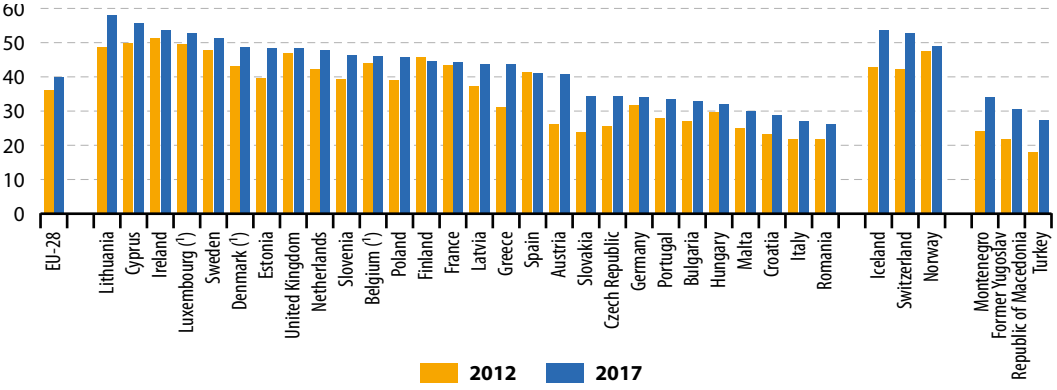
Figure 4.7: Tertiary educational attainment, by sex, EU-28, 2002–2017
(% of the population aged 30 to 34)



Note: Break in time series in 2014 (switch from ISCED 1997 to ISCED 2011).
Source: Eurostat (online data code: sdg_04_20)

Figure 4.7 shows that the tertiary educational attainment rate has increased consistently between 2002 and 2017, by 3.6 % per year on average. The increase has been less pronounced in the short-term period since 2012, with an average annual increase of 2.1 %, but is still well on track to reach the target of 40 % in 2020. The gender gap, however, has been widening by an annual average of 11.7 % between 2002 and 2017 and of 3.5 % between 2012 and 2017.

Figure 4.8: Tertiary educational attainment, by country, 2012 and 2017
(% of the population aged 30 to 34)



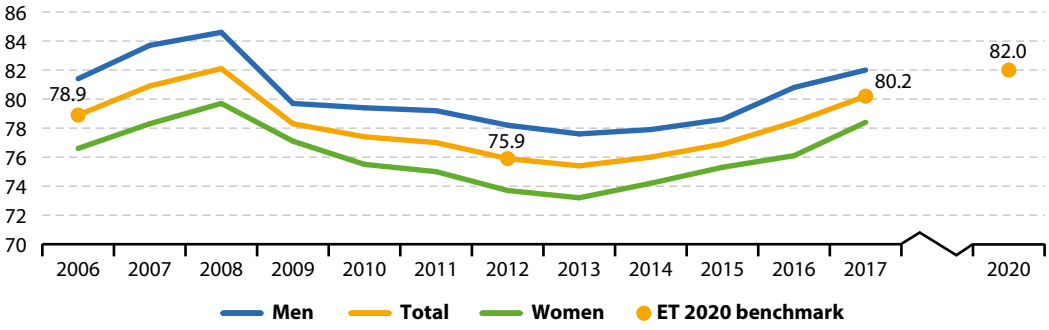
Note: All countries: break in time series in 2014 (switch from ISCED 1997 to ISCED 2011); the change of ISCED has no impact on the comparability over time of this indicator for all Member States, except Austria. (1) Break(s) in time series between 2014 and 2017.
Source: Eurostat (online data code: sdg_04_20)

Employment rate of recent graduates

LONG TERM 2006–2017 * **
SHORT TERM 2012–2017 * **
* Total ** Gender gap

The employment rate of recent graduates is defined as the percentage of the population aged 20 to 34 with at least upper-secondary education (ISCED 2011 levels 3 to 8) who are in employment, not in any education and training, during the four weeks preceding the survey, and who have successfully completed their highest educational attainment one to three years before the survey. The data stem from the EU Labour Force Survey (EU-LFS).

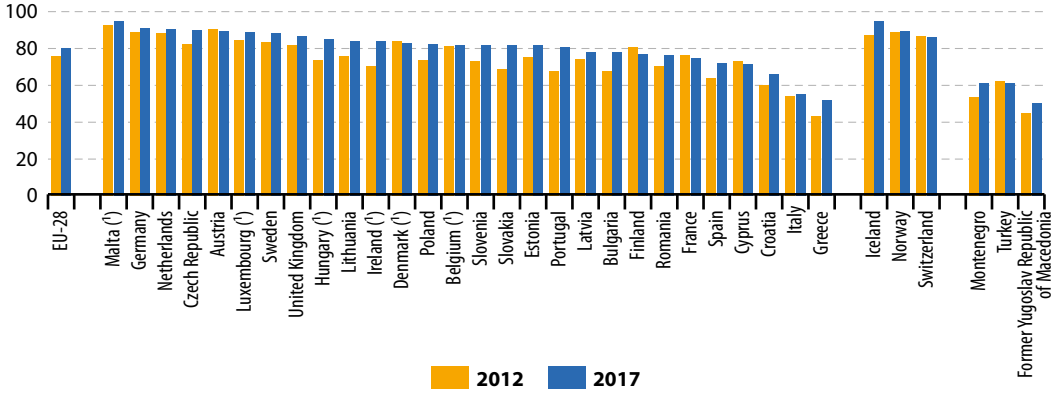
Figure 4.9: Employment rate of recent graduates, by sex, EU-28, 2006–2017
(% of population aged 20 to 34)



Note: Break in time series in 2014 (switch from ISCED 1997 to ISCED 2011).
Source: Eurostat (online data code: sdg_04_50)

As Figure 4.9 shows, the employment rate of recent graduates fell between 2008 and 2013, resulting in an average annual increase of only 0.1 % between 2006 and 2017. In the short-term period, the rate rose by 1.1 % per year on average, and is on track to meeting the 2020 target of 82 %. Moreover, the gender gap narrowed by an annual average of 2.6 % between 2006 and 2017 and of 4.4 % between 2012 and 2017.

Figure 4.10: Employment rate of recent graduates, by country, 2012 and 2017
(% of population aged 20 to 34)



(1) Break in time series between 2014 and 2017.
Note: All countries: break in time series in 2014 (switch from ISCED 1997 to ISCED 2011). The change of ISCED has no impact on the comparability over time of this indicator for all Member States, except Estonia.
Source: Eurostat (online data code: sdg_04_50)

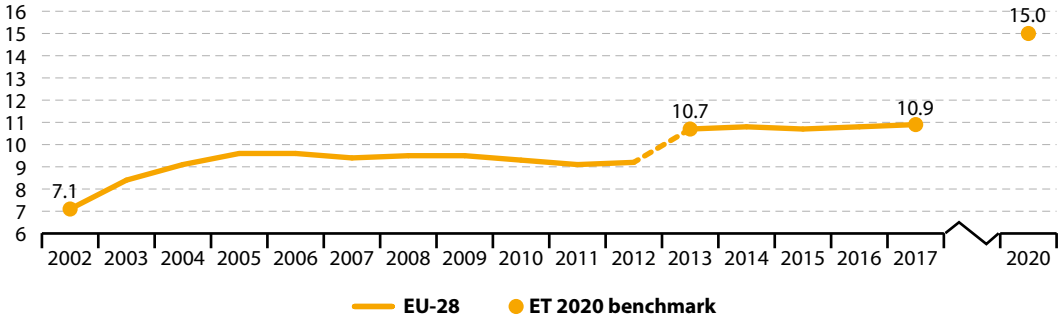
LONG TERM 2002–2017

SHORT TERM 2013–2017

Adult participation in learning

Adult participation in learning refers to people aged 25 to 64 who stated that they received formal or non-formal education and training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding those who did not answer to the question 'participation in education and training'. Adult learning covers formal and non-formal learning activities — both general and vocational — undertaken by adults after leaving initial education and training ([29]). Data stem from the EU Labour Force Survey (EU-LFS).

Figure 4.11: Adult participation in learning, EU-28, 2002–2017
(% of population aged 25 to 64)

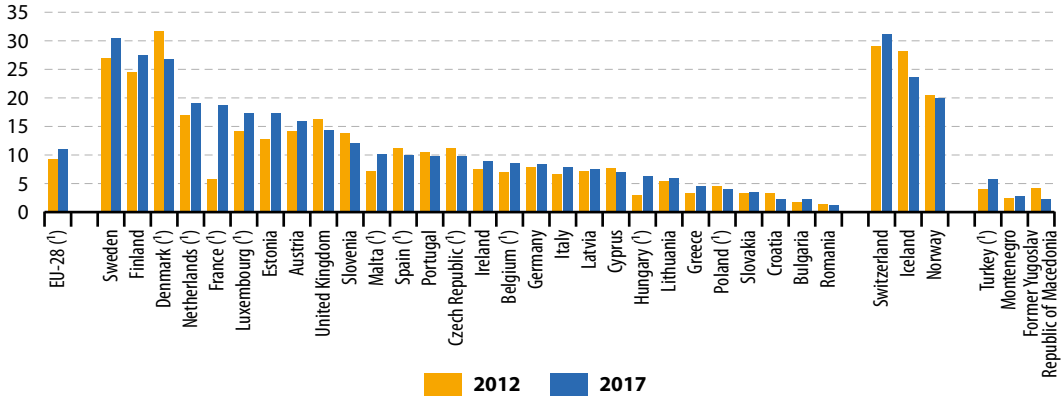


Note: Breaks in time series in 2003, 2006 and 2013.

Source: Eurostat (online data code: sdg_04_60)

Figure 4.11 shows adult participation in learning over the past few years has stagnated. The average annual growth rate between 2002 and 2017 amounts to 2.9 %, but this development has been heavily influenced by a methodological change in the French Labour Force Survey in 2013 ([30]). The short-term growth between 2013 and 2017 amounts to just 0.5 % per year on average, which is not fast enough to reach the target of 15 % by 2020.

Figure 4.12: Adult participation in learning, by country, 2012 and 2017
(% of population aged 25 to 64)



(1) Break(s) in time series between 2012 and 2017.

Source: Eurostat (online data code: sdg_04_60)

Further reading on education

European Commission/EACEA/Eurydice/Eurostat (2014), *Key Data on Early Childhood Education and Care in Europe*, 2014 Edition, Eurydice and Eurostat Report, Luxembourg, Publications Office of the European Union.

European Commission (Directorate-General for Education and Culture) (2017), *Education and Training Monitor 2017*, Luxembourg, Publications Office of the European Union.

European Commission (Directorate-General for Education and Culture) (2016), *PISA 2015: EU Performance and initial conclusions regarding education policies in Europe*, Luxembourg, Publications Office of the European Union.

OECD (2007), *Qualifications Systems: Bridges to Lifelong Learning*, OECD Publishing.

OECD (2015), *Education at a Glance interim Report: Update of employment and educational attainment indicators*, OECD Publishing.

OECD (2017), *Education at a Glance 2017: OECD Indicators*, OECD Publishing.

UNESCO (2014), *Education Strategy 2014–2021*, Paris, France.

UNESCO (2018), *Handbook on Measuring Equity in Education*, Montreal, Canada.

Further data sources on education

OECD, Data on Education.

UNESCO, Data for the Sustainable Development Goals.

Notes

(1) European Commission, Strategic framework — Education & Training 2020.
(2) European Commission (2017), *Education and Training Monitor 2017*, p. 9.
(3) European Commission, Strategic framework — Education & Training 2020.
(4) European Commission/EACEA/Eurydice/Eurostat (2014), *Key Data on Early Childhood Education and Care in Europe*, p. 19.
(5) European Commission, European Social Fund, Better Education.
(6) European Commission (2016), *PISA 2015: EU performance and initial conclusions regarding education policies in Europe*, p. 3.
(7) European Commission, New Skills Agenda for Europe.
(8) European Commission (2016), *A new skills agenda for Europe: Working together to strengthen human capital, employability and competitiveness*, COM(2016) 381 final, Brussels.
(9) Academic Network of European Disability Experts (ANED) (2018), *European comparative data on Europe 2020 & People with disabilities*, Brussels.
(10) Source: Eurostat (online data code: edat_lfse_02).
(11) European Commission (2016), *PISA 2015: EU performance and initial conclusions regarding education policies in Europe*, p. 20.
(12) Source: Eurostat (online data code: edat_lfse_14).
(13) The Bologna process put in motion a series of reforms to make European higher education more compatible, comparable, competitive and attractive for students. Its main objectives were: the introduction of a three-cycle degree system (bachelor, master and doctorate); quality assurance; and recognition of qualifications and periods of study (source: Eurostat, Education and training statistics introduced).
(14) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable, and inclusive growth*, COM(2010) 2020 final, Brussels.
(15) Eurostat, Statistics Explained, Employment rates of recent graduates.
(16) Ibid.
(17) Academic Network of European Disability Experts (ANED) (2018), *European comparative data on Europe 2020 & People with disabilities*, Brussels.
(18) Source: Eurostat (online data code: edat_lfs_9912).
(19) European Commission (2017), *Education and Training Monitor 2017*, p. 64.
(20) Source: Eurostat (online data code: edat_lfse_32).
(21) INSEE, the French Statistical Office, carried out an extensive revision of the questionnaire of the Labour Force Survey. The new questionnaire was used from 1 January 2013 onwards. It has a significant effect on the level of various French LFS-indicators.
(22) OECD (2017), Survey of Adult Skills (PIAAC).
(23) Council of the European Union (2011), *Council Resolution on a renewed European agenda for adult learning*, (2011/C 372/01).
(24) Council of the European Union (2016), *Council Recommendation of 19 December 2016 on Upskilling Pathways: New Opportunities for Adults*, (2016/C 484/01).
(25) Source: Eurostat (online data code: isoc_sk_dskl_i).
(26) Source: Eurostat (online data code: trng_lfse_01).
(27) Source: Eurostat (online data code: trng_lfse_02).
(28) Source: Eurostat (online data code: trng_lfse_03).
(29) The general definition of adult learning covers formal, non-formal and informal training but the indicator adult participation in learning only covers formal and non-formal education and training. For more information, see: Eurostat, Participation in education and training.
(30) INSEE, the French Statistical Office, carried out an extensive revision of the questionnaire of the Labour Force Survey. The new questionnaire was used from 1 January 2013 onwards. It has a significant effect on the level of various French LFS-indicators.

5 Achieve gender equality and empower all women and girls

Goal 5 aims to achieve gender equality by ending all forms of discrimination, violence and any harmful practices against women and girls in the public and private spheres. It also calls for women's full participation and equal opportunities for leadership at all levels of political and economic decision-making.

eurostat supports the SDGs

Ending all forms of discrimination against women and girls and empowering women are crucial to accelerating sustainable development. Empowerment of women and the realisation of gender equality depends on the balanced participation of women and men in formal education, in the labour market and in leadership positions. Equal access to quality education, especially tertiary education, helps to improve chances in life for both men and women. Moreover, closing the gender employment gap is an urgent economic and social objective, for the individual as well as for society as a whole. In addition, promoting equality between women and men in decision-making has been a key objective of European policy for many years. Another important aspect is the elimination of physical and sexual violence against women, which is not only a consequence of gender inequality, but reinforces disparities between women and men.

Table 5.1: Indicators measuring progress towards SDG 5, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Gender-based violence			
Physical and sexual violence to women experienced within 12 months prior to the interview	:	:	page 107
Education			
Gender gap for early leavers from education and training (*)	↑	↑	SDG 4, page 91
Gender gap for tertiary educational attainment (*)	↓	↓	SDG 4, page 94
Gender gap for employment rate of recent graduates (*)	↑ (1)	↑	SDG 4, page 95
Employment			
Gender pay gap in unadjusted form	:	↗	page 108
Gender employment gap	↑	↑	page 109
Inactive population due to caring responsibilities	↓ (1)	↓	page 110
Leadership positions			
Seats held by women in national parliaments	↑	↑	page 111
Positions held by women in senior management	↑ (2)	↑	page 112

(*) Multi-purpose indicator.
(1) Past 11-year period.
(2) Past 14-year period.

Table 5.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
🎯	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Gender equality in the EU: overview and key trends

Monitoring SDG 5 in an EU context focuses on the topics of gender-based violence, education, employment and leadership positions. As shown in Table 5.1, gender equality in the EU has improved in terms of leadership positions. The labour market participation of women has generally also increased over the past few years. However, the gender gap due to caring responsibilities has widened. In the area of education, progress towards gender equality has been mixed.

Gender-based violence

Gender-based violence is a brutal form of discrimination and a violation of fundamental human rights. It is both a cause and a consequence of inequalities between women and men. Physical and sexual violence against women by a partner or a non-partner affects their health and well-being. Moreover, it can hamper women's access to employment with negative effects on their financial independence and the economy overall.

One in three women in Europe has experienced physical and/or sexual violence since the age of 15

In 2012, 8 % of women in the EU had experienced physical and/or sexual violence by a partner or a non-partner in the 12 months prior to the interview. Younger women were more likely to report having been subject to violence ([1]); 13 % of women aged between 18 and 29 had experienced physical or sexual violence in the 12 months prior to the interview, whereas only 5 % of women aged 50 or above had been affected. Looking at a longer period of life, every third woman (33 %) in the EU reported having experienced physical or sexual violence since the age of 15 ([2]).

8 %

of women in the EU in 2012 had experienced physical or sexual violence during the past 12 months

The EU protects women and children from gender-based violence through awareness-raising as well as legislation and practical measures on victims' rights. The Council Framework Decision on the standing of victims in criminal proceedings ([3]) from 2001 establishes basic rights for victims of crime within the EU.

The prevalence of violence in the EU varies greatly both within countries and between countries. Some northern European countries such as Belgium, Denmark, France, Netherlands and Sweden reported the highest rates, with 11 % of women reporting of having experienced physical and/or sexual violence in the 12 months prior to the interview. The lowest rates had been reported in Slovenia (3 %), Spain and Poland (4 %). However, caution is needed when comparing prevalence rates between countries, because in some countries there is a stigma associated with disclosing cases of violence against women in certain settings and to certain people, including interviewers ([4]). In addition, it can also be observed that Member States that rank highest in terms of gender equality tend also to have a greater prevalence of violence against women. This indicates a greater awareness and willingness of women in these countries to disclose experiences of violence to the police or to an interviewer ([5]).

Education

Equal access to a quality education is an important foundation for gender equality and an essential element of sustainable development. Equipping people with the right skills allows them to find

quality jobs and improve their chances in life. Early leavers from education and training may face considerable difficulties in the labour market. For example, they may find it difficult to obtain a secure foothold because employers may be more reluctant to take them on with their limited education. Nowadays, completing compulsory education is often not considered sufficient. Thus, having a degree from a university or other institution of higher education is becoming more important for both men and women. Tertiary education is considered to have an essential role in society, by fostering innovation, increasing economic development and growth, and improving more generally the well-being of citizens. While women are participating in education more actively, the picture is different when it comes to employment rates of young graduates.

The gender gap in early school leavers is narrowing

In the EU, women overall tend to perform better than men when it comes to participation in education. However, the two indicators on participation in basic and tertiary education show divergent trends in the development of these gender gaps. While men are catching up with women in early school leaving, they continue to fall behind in attaining tertiary education.

The gender gap (to the disadvantage of men) for early leavers from education and training in the EU was

3.2

percentage points in 2017

In the EU, men are more likely to leave education and training early. In 2017, 12.1 % of men and 8.9 % of women aged 18 to 24 had left education and training with at most lower secondary education. Since 2002, these shares have fallen steadily. Progress was stronger for men, resulting in the gender gap narrowing from 4.1 percentage points in 2002 to 3.2 percentage points in 2017.

The ET 2020 framework aims to reduce the rates of early school leaving to below 10 %. The Europe 2020 strategy ([6]) includes this benchmark as one of its headline targets. Reducing early leaving is also a priority of the European Social Fund.

A major expansion in higher education systems has taken place in the EU since the introduction of the Bologna process. The share of the population aged 30 to 34 who completed tertiary education increased steadily between 2002 and 2017. However, while the proportion of women with tertiary educational attainment rose from 24.5 % to 44.9 %, the increase was much slower for men, from 22.6 % to 34.9 %. This means the gender gap increased considerably, from 1.9 to 10.0 percentage points between 2002 and 2017.

The tertiary education attainment rate of women in the EU was

10.0

percentage points higher than for men in 2017

Although more women than men have completed tertiary education, the employment rate of female graduates is lower

While women tend to participate more actively in education, the picture changes as soon as young graduates move from education into the labour market. At this stage, male graduates are more likely to have found employment than their female counterparts. This reversed gender gap compared with the education figures is remarkable, considering the important role education and training play in raising employability. In 2017, 82.0 % of men aged 20 to 34 who had at least an upper secondary qualification and had left education and training

The employment rate of recent graduates in the EU was

1.8

percentage points higher for men than for women in 2017

within the past three years were employed compared with 78.4 % of women. However, this gender gap has narrowed over time, from 2.5 percentage points in 2006 to 1.8 percentage points in 2017.

Employment

Ensuring high employment rates for both men and women is one of the EU's key targets. Reducing the gender employment gap — the difference between the employment rates of men and women aged 20 to 64 — is important for equality and a sustainable economy. Women have a higher average level of education in most EU countries. Because a higher level of education is associated with higher average wages, this has a positive impact on the overall gender pay gap. However, it does not prevent women in the EU from being over-represented in industries with low pay levels, and being under-represented in well-paid industries. Because of the gender pay gap and shorter working lives, women earn less over their lifetimes than men. This results in lower pensions and a risk of poverty in old age.

Gender equality has improved in the labour market, but many women remain inactive due to caring responsibilities

The selected indicators for the sub-theme on employment show gender equality in the labour market has increased over the past few years. Since 2011, both the gender employment gap and the gender pay gap have narrowed, with the gender employment gap reaching 11.5 percentage points in 2017 and the gender pay gap reaching 16.2 % in 2016. These levels are 0.7 percentage points (for the employment gap) and 0.6 percentage points (for the pay gap) lower than five years before, indicating that gender differences have declined more quickly for employment rates than for wages. The picture is slightly different regarding the inactive population outside the labour market. Women were far more likely to be economically inactive due to caring responsibilities, for example, for children or other family members.

Men earned

16.2 %

more than women in the EU in 2017

The gender pay gap has decreased slightly over the past years

In 2016, women's gross hourly earnings were on average 16.2 % below those of men in the EU. There are various reasons for the existence and size of the gender pay gap such as the kind of jobs held by women in terms of sectors or occupations, consequences of career breaks or part-time work due to childbearing and caring responsibilities and decisions in favour of family life. Thus, the pay gap is linked to a number of legal, social and economic factors which go far beyond the single issue of equal pay for equal work.

In 2016, the gender pay gap was generally much lower for new labour market entrants and tended to widen with age. This age effect might be a result of the career interruptions women experience during their working life, with older women in particular unable to benefit from specific equality measures that did not exist when they started work, such as flexible working arrangements or childcare facilities.

Reducing the gender pay gap is one of the key priorities of gender policies at both EU and national levels. At EU level, the European Commission prioritised 'reducing the gender pay, earnings and pension gaps and thus fighting poverty among women' as one of the key areas in the framework of the Strategic engagement for gender equality 2016–2019.

In 11 Member States, the gender pay gap was most distinct in the 'financial and insurance activities' sector, with the gross hourly earnings for women on average more than 30 % below those of men in 2016. In four Member States the highest gender pay gaps were in the 'professional, scientific and technical activities' sector and

in another four the 'other service activities' sector had the highest gaps. In contrast, many Member States reported higher average earnings for women than for men in the construction sector and in the 'water supply, sewerage, waste management and remediation activities' sector. These negative gender pay gaps might be due to the so-called selection effect, meaning that only women with higher skills are attracted to these industries ([7]).

While women are still less likely to be employed than men, the gender employment gap has narrowed

Employment rates for women are an indication of the social customs of a country, attitudes towards women in the labour force and family structures in general ([8]). The gender employment gap narrowed by 6.6 percentage points between 2001 and 2017. The strongest reduction occurred during the economic crisis, partly because jobs were lost in traditionally male-dominated fields, such as construction and the automotive industry ([9]). The gap continued to shrink until 2014, but has remained stable since then. In 2017, the proportion of men of working age in employment still exceeded that of women by 11.5 percentage points.

The gender employment gap (in favour of men) was

11.5

percentage points in the EU in 2017

A number of factors contribute to this situation. There is a considerable gender gap with regard to inactivity due to caring responsibilities, especially in countries where childcare services or facilities taking care of elderly and other dependent relatives are unaffordable or absent ([10]). In addition, the longer that women are out of the labour market or remain unemployed due to care duties, the harder it becomes for them to find a job.

Caring responsibilities were by far the main reason for inactivity among women

The gender gap is particularly pronounced regarding inactivity due to caring responsibilities, caused by the lack of available, accessible and quality formal care services, especially for children ([11]). Inactivity due to caring responsibilities was the main reason for women not being part of the labour force, with almost one in three inactive women (31.0 %) reporting this reason in 2017. In contrast, only 4.5 % of inactive men reported being inactive due to caring responsibilities. For them, the main reasons for being inactive were illness or disability, retirement or being in education or training. The share of men who were out of the labour force due to caring responsibilities steadily increased between 2006 and 2017. However, over the same period the share of inactive women due to caring responsibilities increased by a greater amount, widening the gender gap from 23.7 percentage points in 2006 to 26.5 percentage points in 2017.

The gender gap (in favour of men) for inactivity due to caring responsibilities in the EU in 2017 was

26.5

percentage points

The European Pillar of Social Rights stipulates that parents and people with caring responsibilities have the right to suitable leave, flexible working arrangements and access to care services. In addition, women and men shall have equal access to special leaves of absence to fulfil their caring responsibilities and be encouraged to use them in a balanced way. One of the deliverables is the 'New Start' initiative that according to the Communication from the Commission ([12]) addresses the work-life balance challenges faced by working parents and carers.

Leadership positions

Traditional gender roles, a lack of support to allow women and men to balance care responsibilities with work, and political and corporate cultures are some of the reasons why women are underrepresented in decision-making processes. Promoting equality between women and men in decision-making is one of the areas the EU has set as a priority for achieving gender equality. With regard to political decision-making, the proportion of seats held by women in national parliaments (both houses, where relevant) has risen almost steadily since 2003. The share of women in senior management positions has also increased considerably in the same time period.

The share of seats held by women in national parliaments has increased steadily since 2003

Women held 29.7 % of seats in national parliaments in the EU in 2018. This share has increased since 2003, when women accounted for about one-fifth of members in national parliaments. However, the share of men in national parliaments is still considerably higher across the EU as a whole, and there was no single EU country in early 2018 where women held more seats than men.

29.7 %
of seats in national parliaments in the EU were held by women in 2018

Factors contributing to this under-representation include that women are seldom leaders of major political parties, which are instrumental in forming future political leaders, or gender norms and expectations reducing the pool of female candidates for selection as electoral representatives. The share of female members of government (senior and junior ministers) in the EU increased from 23.3 % in 2003 to 29.5 % in 2018. The number of female presidents and prime ministers in EU countries also went up. In 2018, there were three female heads of government (10.7 %) in comparison to none in 2003. In the time period considered, the share of female heads of government was never higher than 14.3 %, meaning there were never more than four women in this executive position at the same time ([13]).

The European Commission supports Member States in improving the gender balance in decision-making positions, by monitoring the situation and disseminating information, data and analysis of trends in the field, in particular through its annual reports on equality between women and men. In addition, there is a Mutual Learning Programme in Gender Equality to exchange good practices.

The share of seats held by women in national parliaments varied considerably between EU countries in 2018. In Sweden, almost half of the seats were held by women (45.8 %). In Hungary, the share of women in parliaments was four times lower (11.6 %). Between 2013 and 2018, the proportion of seats held by women in national parliaments increased in the majority of EU countries. However, the proportion decreased in eight EU countries, by up to eight percentage points. Effectively designed electoral gender quotas ([14]) as well as proportional representation systems ([15]) may explain the higher representation of women in some cases.

In 2017, a quarter of the board members of the largest listed companies were women

The share of women in boards of the largest listed companies was 25.3 % in 2017. Between 2003 and 2017, there was an almost steady increase of 16.8 percentage points. However, the numbers mean that three out of four board members of largest listed companies are still men. The data on board members nevertheless provide evidence of the positive impact of legislative action on the issue of female representation in boards ([16]).

Promoting gender equality in decision-making is a priority area for the European Commission and one of the key areas for action of the Strategic Engagement for Gender Equality. The goal of at least 40 % representation of the under-represented gender among non-executive directors of companies listed on stock exchanges is confirmed. In addition, the importance of a better gender balance among executive directors and in the talent pipeline is also recognised.

The share of women is lower when considering only the members of the second highest decision-making body of the largest listed companies (such as management board in case of a two-tier governance system and executive/management committee in a unitary system). In 2017, the share of female members in the two highest decision-making bodies was 15.8 % across the EU; in 2012, it was 10.4 %. The fact that senior management positions are more likely to be held by men is one of the reasons for the gender pay gap ([17]).

25.3 %

of senior management positions in the largest listed companies in the EU were held by women in 2017

The share of female board members varied considerably between EU countries. In 2017, France was the closest to parity in boards with 43.4 % female members. In the same year, Estonia had only 7.4 % female board members. While the representation of women in corporate boards improved in most Member States, the changes between 2012 and 2017 have been far from uniform. Italy, France and Belgium stand out with increases of over 17 percentage points, while at the other end of the spectrum there has been no significant progress (less than two percentage points) in Slovakia and Latvia and even a decline in Lithuania, the Czech Republic and Estonia.

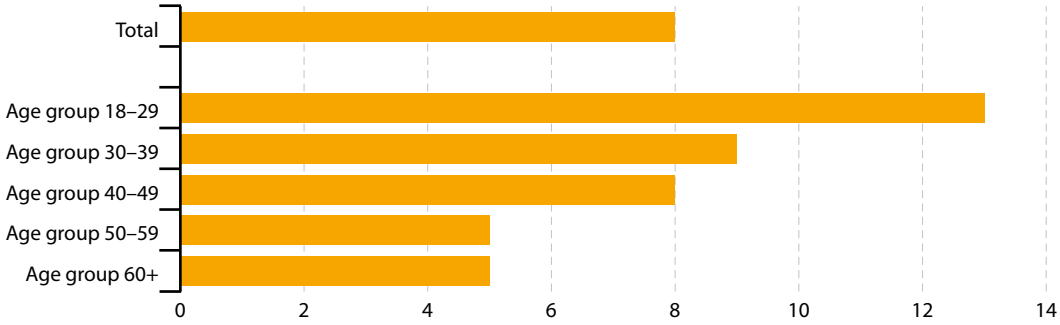
Presentation of the main indicators

Physical and sexual violence to women experienced within 12 months prior to the interview

X Insufficient data to calculate trends

This indicator is based on results from a survey by the European Union Agency for Fundamental Rights (FRA). Women were asked whether they had experienced physical and/or sexual violence in the 12 months prior to the interview.

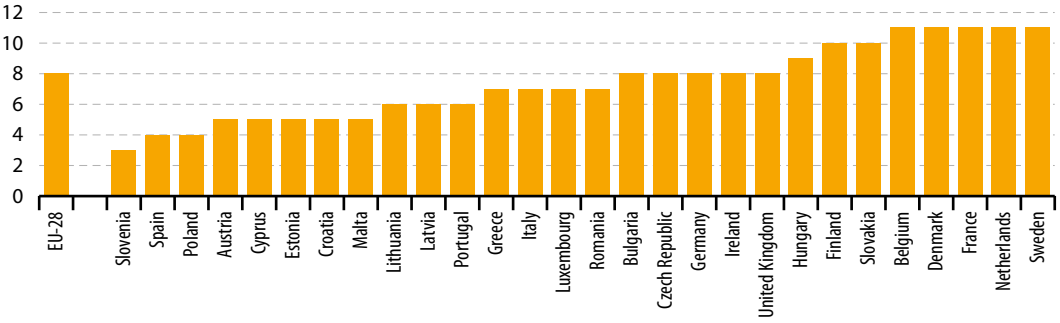
Figure 5.1: Physical and sexual violence to women experienced within 12 months prior to the interview, EU-28, 2012
(% of women)



Source: European Union Agency for Fundamental Rights (FRA) (online data code: sdg_05_10)

In 2012, 8 % of women in the EU had experienced physical and/or sexual violence by a partner or a non-partner in the 12 months prior to the interview. Looking at longer life spans, every third woman (33 %) in the EU reported having experienced physical or sexual violence by a partner or a non-partner since the age of 15 ([18]).

Figure 5.2: Physical and sexual violence to women experienced within 12 months prior to the interview, by country, 2012
(% of women)



Source: European Union Agency for Fundamental Rights (FRA) (online data code: sdg_05_10)

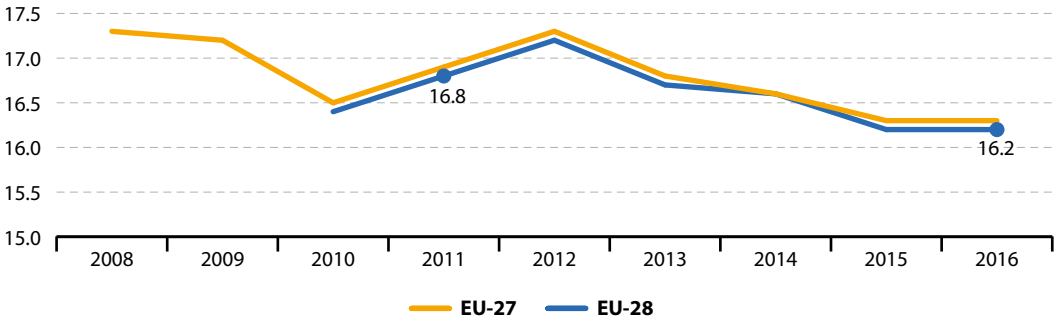
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2011–2016

Gender pay gap in unadjusted form

The gender pay gap in unadjusted form represents the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees. The indicator has been defined as unadjusted because it gives an overall picture of gender inequalities in terms of pay, and measures a concept which is broader than the concept of equal pay for equal work. The gender pay gap is based on the methodology of the structure of earnings survey (SES), which is carried out every four years.

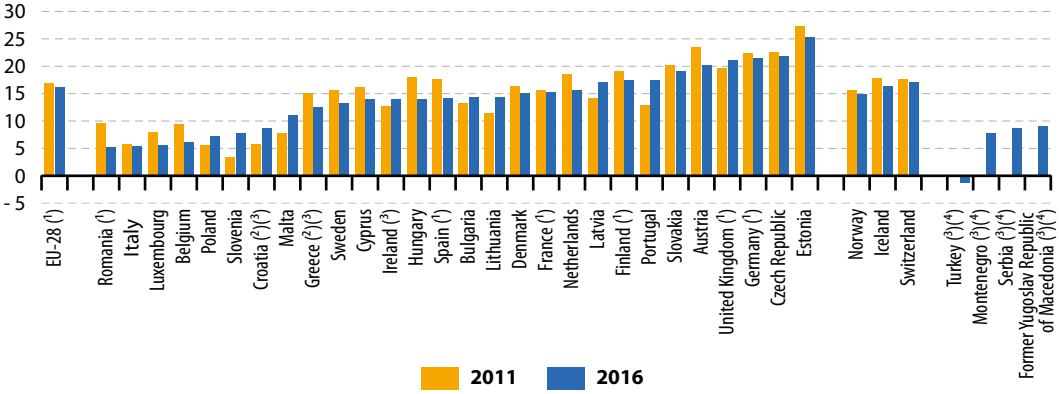
Figure 5.3: Gender pay gap in unadjusted form, EU-27 and EU-28, 2008–2016
(% of average gross hourly earnings of men)



Note: 2009, 2015 and 2016 data are provisional.
Source: Eurostat (online data code: sdg_05_20)

In 2016, women's gross hourly earnings were on average 16.2 % below those of men in the EU. Between 2011 and 2016, the gender pay gap decreased by 0.7 % per year on average.

Figure 5.4: Gender pay gap in unadjusted form, by country, 2011 and 2016
(% of average gross hourly earnings of men)



(1) 2016 data are provisional or estimates.
(2) 2010 data (instead of 2011).
(3) 2014 data (instead of 2016).
(4) No data for 2011.

Source: Eurostat (online data code: sdg_05_20)

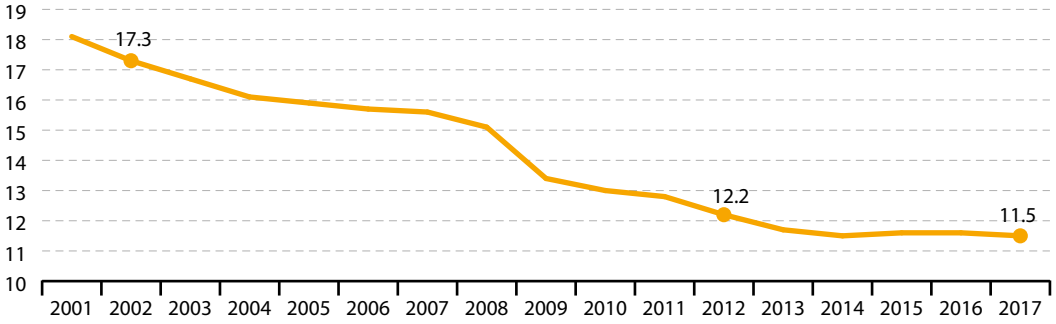
Gender employment gap

LONG TERM 2002–2017

SHORT TERM 2012–2017

The gender employment gap is defined as the difference between the employment rates of men and women aged 20 to 64. The employment rate is calculated by dividing the number of people aged 20 to 64 in employment by the total population of the same age group. The indicator is based on the EU Labour Force Survey (EU-LFS).

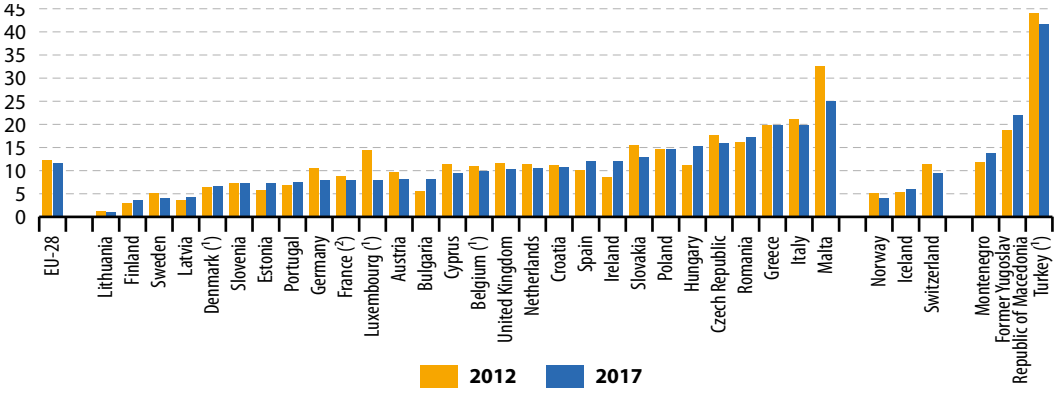
Figure 5.5: Gender employment gap, EU-28, 2001–2017
(percentage points, persons aged 20–64)



Source: Eurostat (online data code: sdg_05_30)

As Figure 5.5 shows, the gender employment gap in the EU has been steadily decreasing since 2001. It decreased by an average of 2.7 % per year between 2002 and 2017, and by a slightly slower pace of 1.2 % per year in the short-term period since 2012.

Figure 5.6: Gender employment gap, by country, 2012 and 2017
(percentage points, persons aged 20–64)



(1) Break(s) in time series between 2012 and 2017.
(2) 2012 Data refer to metropolitan France.

Source: Eurostat (online data code: sdg_05_30)

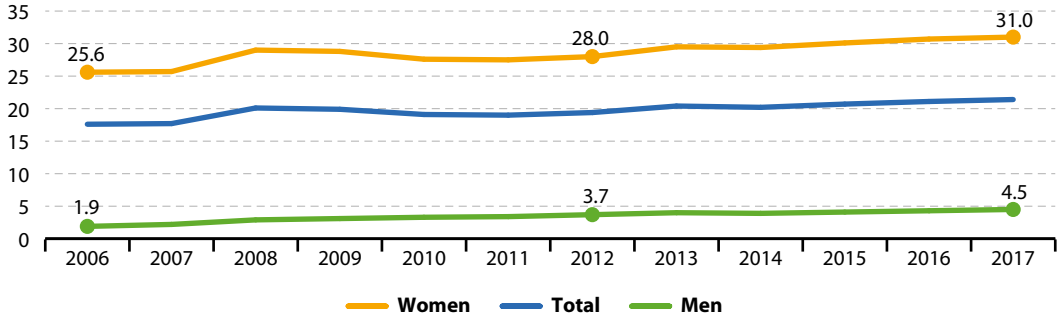
LONG TERM 2006–2017

SHORT TERM 2012–2017

Inactive population due to care responsibilities

The economically inactive population comprises individuals that are not working, not actively seeking work and not available to work even if they found a job. Therefore, they are neither employed nor unemployed and considered to be outside the labour force. This definition used in the EU Labour Force Survey (EU-LFS) is based on the guidelines of the International Labour Organization.

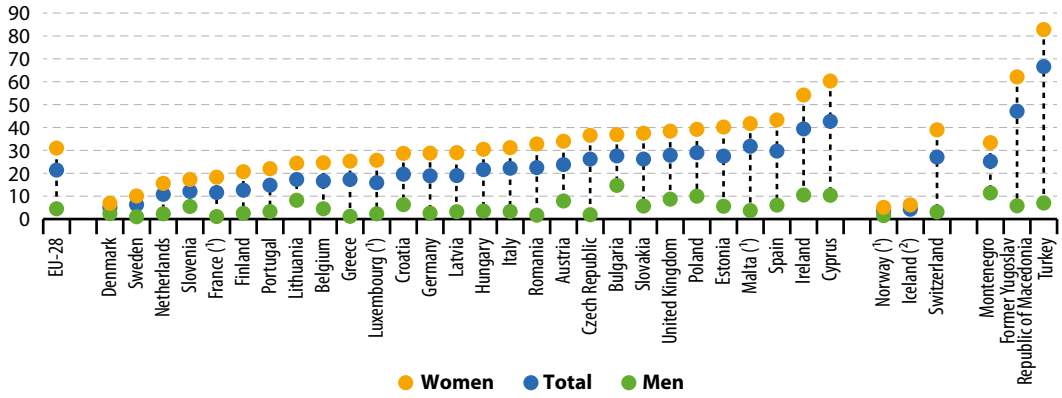
Figure 5.7: Inactive population due to caring responsibilities, by sex, EU-28, 2006–2017
(% of inactive population aged 20 to 64)



Source: Eurostat (online data code: sdg_05_40)

The share of men out of the labour force due to caring responsibilities steadily increased between 2006 and 2017. However, as the share of inactive women due to caring responsibilities increased even more over the same period, the gender gap widened on average by 1.0 % per year between 2006 and 2017 and by 1.7 % per year in the short-term period.

Figure 5.8: Inactive population due to caring responsibilities, by sex, by country, 2017
(% of inactive population aged 20 to 64)



(1) Data for men have low reliability.
(2) No data for men.

Source: Eurostat (online data code: sdg_05_40)

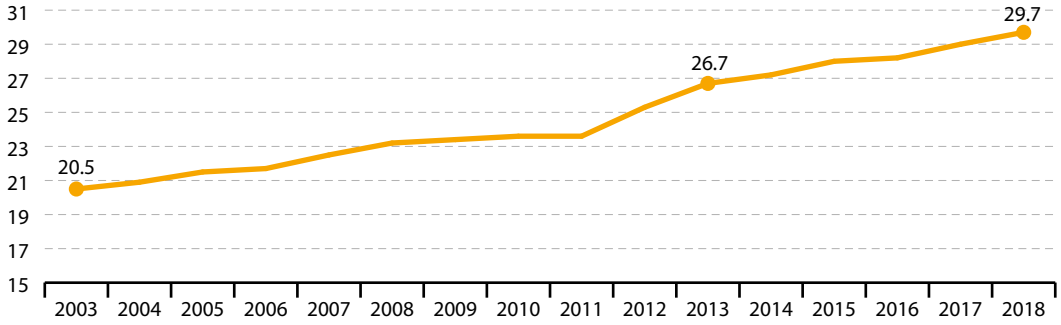
Seats held by women in national parliaments

This indicator refers to the proportion of women in national parliaments in both chambers (lower house and upper house, where relevant). The data stem from the Gender Statistics Database of the European Institute for Gender Equality.

LONG TERM 2003–2018

SHORT TERM 2013–2018

Figure 5.9: Seats held by women in national parliaments, EU-28, 2003–2018
(% of seats)

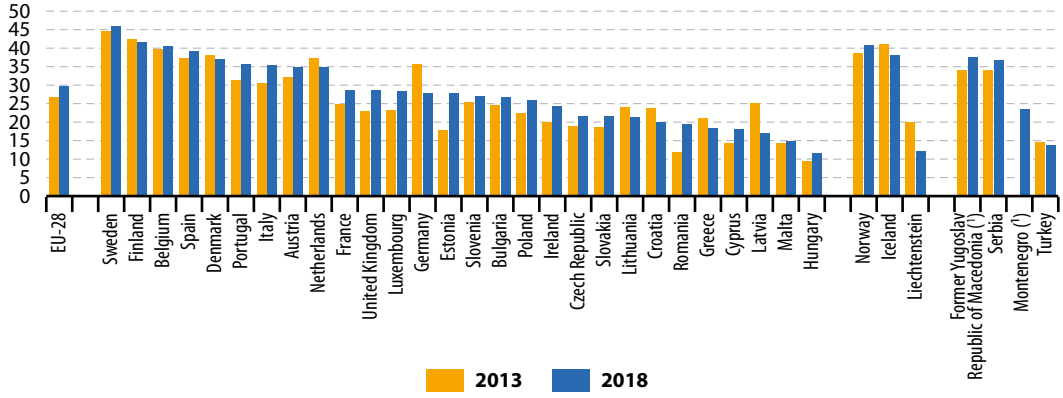


Note: 2018 data are provisional.

Source: European Institute for Gender Equality (EIGE) (online data code: sdg_05_50)

Women held 29.7 % of seats in national parliaments in the EU in 2018. The share has increased by 2.5 % per year between 2003 and 2018 and slightly slower, at a rate of 2.2 %, over the short time period.

Figure 5.10: Seats held by women in national parliaments, by country, 2013 and 2018
(% of seats)



Note: 2018 data are provisional (for all countries).
(1) No data for 2013.

Source: European Institute for Gender Equality (EIGE) (online data code: sdg_05_50)

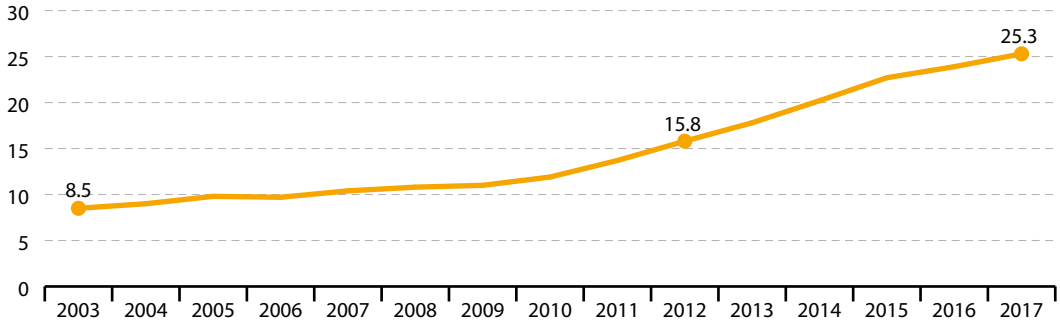
LONG TERM 2003–2017

SHORT TERM 2012–2017

Positions held by women in senior management

This indicator measures the share of female board members in the largest publicly listed companies. The data presented in this section stem from the Gender Statistics Database of the European Institute for Gender Equality.

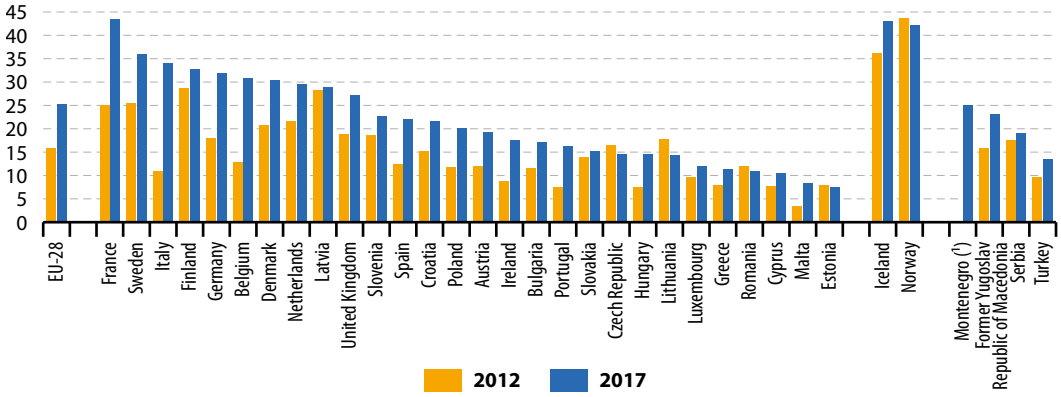
Figure 5.11: Positions held by women in senior management, EU-28, 2003–2017
(% of positions)



Source: European Institute for Gender Equality (EIGE) (online data code: sdg_05_60)

The share of women on the boards of the largest listed companies was 25.3 % in 2017. In the years between 2003 and 2017, there was an increase of 8.1 % per year. In the short term, the increase was even stronger, with 9.9 % per year on average.

Figure 5.12: Positions held by women in senior management, by country, 2012 and 2017
(% of positions)



(1) No data for 2012.

Source: European Institute for Gender Equality (EIGE) (online data code: sdg_05_60)

Further reading on gender equality

European Commission (2014), *Tackling the gender pay gap in the European Union*, Luxembourg, Publication Office of the European Union.

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European Commission (2018), *Report on equality between women and men in the EU*, Luxembourg.

European Institute for Gender Equality (2018), *Study and work in the EU: set apart by gender*, Luxembourg.

European Institute for Gender Equality (2017), *Gender equality in political decision-making*.

UN Women (2016), *Progress of the World's Women 2015–2016: Transforming Economies, Realizing Rights*.

UN Women (2018), *Turning Promises into Action: Gender equality in the 2030 Agenda for Sustainable Development*.

World Economic Forum (2017), *The Global Gender Gap Report 2017*.

Further data sources on gender equality

United Nations, Department of Economic and Social Affairs, Statistics Division (2015), *The World's Women 2015: Trends and Statistics*.

European Institute for Gender Equality, Gender Statistics Database.

Notes

(1) European Union Agency for Fundamental Rights (2014), *Violence against women: an EU-wide survey, Main results*, Luxembourg, Publications Office of the European Union, p. 25.
(2) Id., p. 17.
(3) Council of the European Union (2001), *Council framework decision of 15 March 2001 on the standing of victims in criminal proceedings*, 2001/220/JHA.
(4) European Union Agency for Fundamental Rights (2014), *Violence against women: an EU-wide survey, Main results*, Luxembourg, Publications Office of the European Union, p. 25–26, 32.
(5) Ibid.
(6) European Commission (2010), *Europe 2020: A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
(7) European Federation of Public Service Unions (2013), *The Gender Pay Gap in Public Services*, p. 9, p. 51.
(8) International Labour Organisation (2015), *Key Indicators of the Labour market: Full report, Ninth Edition*, Geneva, International Labour Office, p. 17.
(9) European Commission (2009), *Economic Crisis in Europe: Causes, Consequences and Responses*, Directorate-General for Economic and Financial Affairs, p. 36.
(10) European Commission's Expert Group on Gender and Employment Issues (2009), *The provision of childcare services: A comparative review of 30 European countries*, Luxembourg, Office for Official Publications of the European Communities, p. 23–24.
(11) European Commission (2017), *Draft Joint Employment Report from the Commission and the Council accompanying the Communication from the Commission on the Annual Growth Survey 2018*, COM(2017) 674 final, Brussels, p. 57.
(12) European Commission (2017), *An initiative to support work-life balance for working parents and carers*, COM(2017) 252 final, Brussels.
(13) European Institute for Gender Equality, Gender Statistics Database (National governments: presidents and prime ministers).
(14) Freidenvall, L., Dahlerup, D. and Johansson, E. (2013), *Electoral Gender Quota, Systems and their Implementation in Europe*, Brussels, p. 5.
(15) European Parliament (2017), *Women in parliaments, At a glance*, Infographic, p. 2.
(16) European Commission (2017), *2018 Report on equality between women and men in the EU*, Luxembourg, Publication Office of the European Union, p. 31.
(17) European Commission (2017), *Employment and Social Developments in Europe, Annual Review 2017*, Luxembourg, Publications Office of the European Union, p. 34.
(18) European Union Agency for Fundamental Rights (2014), *Violence against women: an EU-wide survey, Main results*, Luxembourg, Publications Office of the European Union, p. 17.

6 Ensure availability and sustainable management of water and sanitation for all

Goal 6 calls for ensuring universal access to safe and affordable drinking water, sanitation and hygiene, and ending open defecation. It also aims at improving water quality and water-use efficiency and encouraging sustainable abstractions and supply of freshwater.

eurostat supports the SDGs

Access to water is a basic human need. The provision of drinking water and sanitation services is a matter of public and environmental health in the EU. Clean water in sufficient quantity is also of paramount importance for agriculture, industry and environment and plays a crucial role in providing climate related ecosystem services. The most important pressure on Europe's water resources is pollution from agriculture and municipal wastewater, as well as over-abstraction, which can become a severe issue in southern Europe during the summer months. In the past 30 years, the European Commission has put considerable effort in devising policies that address these challenges and aim to protect the quality of Europe's water resources and to ensure their sustainable and efficient use.

Table 6.1: Indicators measuring progress towards SDG 6, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Sanitation			
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household	↑ (1)	↑	page 122
Population connected to at least secondary wastewater treatment	:	:	page 123
Water quality			
Biochemical oxygen demand in rivers	↑ (2)	↑	page 124
Nitrate in groundwater	↗ (3)	↑	page 125
Phosphate in rivers	↑ (2)	↘	page 126
Freshwater bathing sites with excellent water quality (*)	:	↑	SDG 14, page 271
Water use efficiency			
Water exploitation index	:	:	page 127

(*) Multi-purpose indicator.
(1) Past 11-year period; trend refers to EU-27.
(2) Past 14-year period.
(3) Past 12-year period.

Table 6.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
🎯	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Clean water and sanitation in the EU: overview and key trends

Monitoring SDG 6 in an EU context focuses on the topics sanitation, water quality and water use efficiency. As Table 6.1 shows, the EU has achieved significant progress in the areas of sanitation and water quality over the past few years, with the exception of a recent increase in phosphate concentrations in European rivers. The progress in water use efficiency cannot yet be measured due to the lack of aggregated EU-level data.

Protection of water resources, water ecosystems and drinking and bathing water is a cornerstone of EU water policy, as confirmed in the 7th Environment Action Programme ([1]). The EU health and food safety policy also contributes to high water and sanitation standard in terms of preventing the spread of communicable diseases. The EU in its external relations, its development cooperation policy (through the European consensus and the Agenda for Change), the European Neighbourhood Policy and the EU Enlargement Policy is supporting third countries' efforts to achieve this sustainable development goal through bilateral assistance programmes or regional initiatives.

Sanitation

The provision of drinking water and the adequate treatment of sewage is a matter of public and environmental health. As a vital resource, water is considered a public good in the EU. Thus, drinking water and sanitation services have been high on the political agenda of the EU and its Member States during the past decades. As a result, water utilities are subject to strict regulation regarding the quality and efficiency of services. The indicators chosen to monitor sanitation are the share of the population having neither a bath, nor a shower, nor indoor flushing toilet in their household and the share of the population connected to at least secondary wastewater treatment.

1.9 %
of the EU population lacked sanitary facilities at home in 2016

The vast majority of EU citizens has access to basic sanitation and is connected to secondary wastewater treatment

Overall, provision of water services in the EU was already of good quality and connection rates were high more than ten years ago, and have continued to improve. The share of the population having neither a bath, nor a shower, nor indoor flushing toilet in their household decreased from 3.7 % in 2005 to 1.9 % in 2016. Data also show that between 2010 and 2015, the amount of people connected to secondary wastewater treatment increased.

Conventional primary wastewater treatment consists of basic physical processes, such as filtration and sedimentation, and mainly aims to remove suspended solids. Biological oxygen demand (BOD), which is a proxy for organic water pollution, is only reduced by 20–30 % by primary treatment processes. In contrast, secondary treatment processes, which are typically applied after primary treatment, reduce BOD by at least 70 % through biological or chemical processes.

Growth in the share of people connected to secondary treatment indicates that the implementation of the Urban Wastewater Treatment Directive ([2]), which started in the 1990s, has made an important contribution to reducing pollution and improving water quality in Europe's rivers.

Differences between Member States exist with regards to levels of access to water services and sanitation

In 2016, in the majority of EU Member States almost every household had basic sanitary facilities. However, the share of the population without access

to basic sanitary appliances such as a bath or shower and a flushing toilet varied strongly between countries, ranging from 30.0% to 0%, with the north- and central-western EU Member States tending to show the lowest values. In general, the majority of countries reported shares of below 1%, which indicates the EU aggregated data are strongly influenced by only a few countries. Some, mostly eastern European, countries still face considerable problems: in 2016, four countries from eastern Europe reported more than 10% of their population lacked such access. The situation was worst in Romania, where almost one-third of the population (30.0%) was affected.

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Member States reported that more than 80% of their population were connected to at least secondary wastewater treatment in 2015

It is important to stress, however, that access to basic sanitary facilities is strongly inter-linked with poverty. Poor people, with an income below 60% of the median equivalised disposable income, and thus considered to be at risk of poverty, were much more affected by a lack of access to a bath, shower or toilet in their household. In 2016, 5.8% of poor people reported being affected by this situation compared to only 1.1% of those living above the poverty threshold ([3]). The share of poor people without access to basic sanitation facilities was particularly high in Romania, Lithuania, Latvia and Bulgaria, with more than 60% of Romanians who lived below the poverty threshold reporting a lacking access to sanitation in 2016. Notably, in Romania almost 20% of the richer population was affected by this situation in 2016.

Similar to basic sanitary facilities, the share of the population connected to at least secondary wastewater treatment was highest in the 'old' EU-15 Member States, which due to their earlier membership had a head start on implementing the Water Framework Directive. Here, most of the lowest-scoring countries are in the Mediterranean and Black Sea region.

Note that for countries with a low population density, it may be unrealistic to implement comprehensive secondary treatment, especially in remote areas. In line with this understanding, the Urban Wastewater Treatment Directive only obliges agglomerations with more than 2 000 person equivalents to introduce a secondary treatment level. However, even in the absence of secondary treatment, such smaller agglomerations are still encouraged to find alternative solutions to reach the same level of protection for waterbodies. Thus, the share of the population connected to secondary treatment is not expected to eventually reach 100% in all countries.

EU water policy provides a framework to comprehensively address water protection and for achieving good status for inland surface waters, transitional waters, coastal waters and groundwater. The EU health and food safety policy also contributes to high standards for water and sanitation in terms of preventing the spread of communicable diseases. The EU Enlargement Policy promotes the extension of EU norms to candidate countries covering water quality, wastewater treatment, but also water management and flood prevention.

Water quality

Protecting water from pollution and deterioration of water resources has long been a focus of EU environmental policy. Intensification of agriculture, the accidental spill of harmful substances and the discharge of insufficiently treated domestic and industrial wastewater can pose a threat to human and environmental health. Along with changes to the hydromorphology of water bodies, it is also a barrier to sustainable development. Water quality is monitored through four indicators looking at pollutants in rivers and in groundwater as well as at bathing water quality. Most of these indicators show clearly favourable trends for the EU over the past few years, with the exception of recently rising phosphate concentrations in European rivers.

Declining trend of BOD values in European rivers due to improved wastewater treatment

As a direct result of improved wastewater treatment in the EU, the biochemical oxygen demand (BOD) in European rivers is decreasing. BOD is a proxy for the amount of organic water pollution. It is measured by the amount of oxygen that microorganisms consume while digesting the organic material in a water sample in the dark over five days of incubation at 20 °C. In nature, BOD values have been shown to range from less than 1 mg/L in very clean rivers to more than 15 mg/L in heavily polluted rivers. Typically, BOD is a function of municipal wastewater discharged into watercourses, but BOD levels can also be elevated by industrial or agricultural effluents. Very high BOD concentrations can lead to a deoxygenation of water with severe consequences for fish and invertebrates and the aquatic ecosystem as a whole.

In 2014, the biochemical oxygen demand in European rivers amounted to

1.9 mg/L

As the data show, BOD in European rivers has declined on average by 2.6 % per year from 2000 (2.81 mg/L) to 2014 (1.94 mg/L) and by 1.9 % annually from 2009 (2.14 mg/L) to 2014, indicating that the decrease is slowing. This can possibly be attributed to the already widespread implementation of secondary treatment level in wastewater treatment plants.

Eutrophication is still a major issue for Europe's aquatic environment

The newest assessment of European waters published by the European Environment Agency (EEA) concludes that while chemical pollution affects the most EU surface water bodies (49 %), nutrient pollution is also impacting 28 % of the EU's surface water bodies ([5]). In some regions, concentrations in rivers are still high enough to even cause eutrophication in coastal waters. This shows that although eutrophication has decreased since the 1990s, it remains one of the major threats to many surface water bodies achieving good water quality. Eutrophication describes a process caused by input of the nutrients nitrate/ammonia (N) and phosphorous (P) into water bodies and can lead to algae bloom and oxygen depletion of surface waters. With increased nutrient levels, communities of water

The Water Framework Directive ([4]) aims to reach a 'good ecological status' for all water bodies in Europe. The definition includes parameters for a good chemical status (nitrogen, phosphorous and oxygen concentration) as well as biological status (occurrence of oligotrophic species composition).

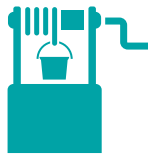
The 7th Environment Action Programme sets the policy agenda for the years from 2015 to 2020 with the naming of nine priorities. Priorities 1, 2, 3, 5, 6 and 8 deal in particular with the improvement of the status of water resources. Furthermore, priority objectives 4 and 7 are aimed at improving the integrated implementation of environmental policy in general that is clearly important for the water sector as well as other sectors.

The Water Framework Directive ([6]) is the main European legislation aiming to prevent pollution. It integrates several previously existing Directives, including the Freshwater Fish Directive (which sets standards for P concentration) and the Groundwater Directive (which sets a threshold for N). In addition, the Bathing Water Directive ([7]) obliges Member States to preserve, protect and improve the quality of the environment at bathing water sites in order to protect human health. The two main parameters to be used to monitor and assess the quality of bathing waters and to classify them are intestinal enterococci and E.coli.

organisms change as organisms that occur in oligotrophic (nutrient poor) waters are replaced by more eutrophic species.

The main sources of nutrient inputs can be attributed to agricultural practices through the application of mineral and organic fertilisers as well as insufficiently treated wastewater from industry, such as food, beverages, pulp and paper production ([8]).

Nitrates, among other chemicals, can infiltrate and potentially contaminate groundwater bodies. They are the most common pollutants causing poor chemical status of groundwater in the EU. In the second reporting cycle of the Water Framework Directive, nitrates caused poor chemical status in 18 % of groundwater body area, and 24 Member States were reportedly affected by this problem ([9]). This is particularly problematic because groundwater, in addition to surface water, is an important source of drinking water in Europe. On average, nitrate concentrations in European groundwater bodies are within the EU drinking water standard of 50 milligrams per litre. Between 2000 and 2012, nitrate concentrations in groundwater mostly remained below 20 mg/L, reaching 19.1 mg/L in 2012. However, over the period 2012 to 2015, 13.2 % of groundwater stations were considered polluted under the Nitrates Directive (exceeding 50 mg of nitrates per litre) ([10]) and there are still regions with very intensive agriculture where nitrates concentrations exceed safe levels and thus further groundwater treatment is needed to protect human health.



In 2012, the concentration of nitrates in groundwater in Europe reached

19.1 mg/L

The application of mineral and organic fertilisers in agricultural production is closely linked with ammonia emissions. It is a common by-product of animal waste, slurry or incomplete fertiliser uptake. Countries with the highest ammonia emissions per hectare of utilised agricultural area in Europe, such as Malta, Cyprus, Spain, Belgium or Luxembourg, are also struggling most with high nitrates levels in groundwater.

The Nitrates Directive ([11]) takes action to prevent nitrates from agricultural sources polluting ground and surface waters by decreasing the nitrogen balance on agricultural land (also see the chapter on SDG 2 'Zero hunger' on page 52). However, major efforts are still needed to restore optimal water quality across the EU. All Member States have set up nitrate action programmes to prevent nitrates from agricultural sources polluting ground and surface waters.

In contrast to the long-term trend for groundwater, water quality in European rivers has increased significantly between 2000 and 2014. Average concentrations of phosphate in European rivers show a downwards trend and have reached a low of 0.059 mg phosphate per litre in 2011. This overall positive trend is to some extent a result of the implementation of measures under the Urban Waste Water Treatment Directive over the past two and a half decades and especially the introduction of phosphate-free detergents. However, a slight increase can be observed since 2011, reaching 0.068 mg phosphate per litre in 2014.

In 2014, the concentration of phosphates in European rivers was

0.068 mg/L

Vast majority of fresh and coastal marine bathing waters show 'excellent' bathing water quality

Pure, clean water is not only vital to human health but also for people's well-being. Overall, the share of inland freshwater bathing sites with excellent water quality in the EU has been growing since 2011. According to the latest Report

82.1 %

of inland bathing sites in the EU showed excellent bathing water quality in 2017

on European Bathing Water Quality ([12]), 86.3 % of all coastal bathing sites and 82.1 % of inland bathing sites showed excellent bathing water quality in 2017. Wastewater pollution and less dilution of water discharges are the main reasons why the share of inland bathing sites with excellent water quality is still lower than for marine bathing sites.

The Bathing Water Directive ([13]) requires Members States to monitor and assess the bathing water for at least two parameters of (faecal) bacteria. In addition, they must inform the public about bathing water quality and beach management, through the so-called bathing water profiles. These profiles contain, for instance, information on the kind of pollution and sources that affect bathing water quality and are a risk to bathers' health. The Directive requires Member States to have reached at least 'sufficient' status at all sites by 2015.

Water use efficiency

To manage water resources sustainably, the quantity of water use must be considered in addition to its quality. Therefore, SDG 6 also calls for a focus on water use efficiency, with an aim of increasing it by 2030 across all sectors in order to use freshwater sustainably and thus to decrease water scarcity. The EU aims to increase resource efficiency and the sustainable use of water resources that can be described by the water exploitation index.

Water stress is low in most EU countries, but still high in a few

When considered over the period of a year, water stress in most Member States is still rare. However, the water exploitation index (WEI) values for Cyprus and Malta were above the severe water scarcity threshold of 40 % in 2015 and have been worsening since 2000. A further two countries were above the 20 % threshold: Belgium and Spain. Apart from Belgium, all of these countries are located in the water scarce Mediterranean region.

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out of 20 reporting Member States were below the water scarcity threshold in 2015

Water scarcity in Belgium can be explained by the fact that about two-thirds (68 % in 2009 ([14])) of the water abstracted is used for cooling purposes in electricity generation, to a large extent in nuclear reactors ([15]). Because the country has a relatively small amount of available renewable freshwater ([16]), the share of abstracted water appears disproportionately high. While the cooling water is redirected to rivers after use (returns) in some countries, a shortcoming of the WEI indicator is that it sums up all abstracted water shares without this distinction. A better indication of actual water exploitation, which overcomes the first shortcoming, would be the water exploitation index plus (WEI+), which the EEA assessed for the period 2002 to 2014 for European river basins but not yet for Member States or at EU level. The WEI+ includes return flows and therefore is a better reflection of net consumption ([17]).

The 7th Environment Action Programme of the European Commission aims at increasing resource and thus water efficiency. Ensuring water is used in appropriate quantities is one objective of the Water Framework Directive. To overcome the shortcomings of the water exploitation index, the European Environment Agency is developing an improved indicator WEI+.

Presentation of the main indicators

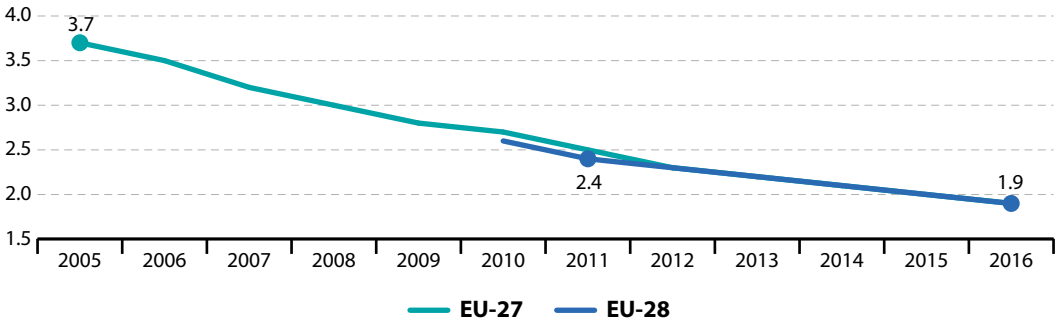
LONG TERM 2005–2016

SHORT TERM 2011–2016

Population having neither a bath, nor a shower, nor indoor flushing toilet in their household

This indicator reflects the share of total population having neither a bath, nor a shower, nor an indoor flushing toilet in their household. Data presented in this section stem from the EU Statistics on Income and Living Conditions (SILC).

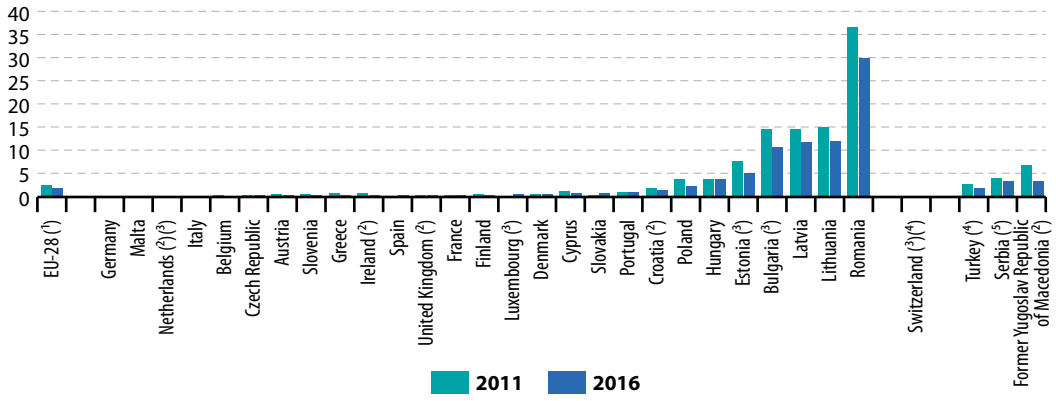
Figure 6.1: Population having neither a bath, nor a shower, nor indoor flushing toilet in their household, EU-27 and EU-28, 2005–2016
(% of population)



Source: Eurostat (online data code: sdg_06_10)

Figure 6.1 shows that the share of the EU population having neither a bath, nor a shower, nor indoor flushing toilet in their household fell noticeably between 2005 and 2016, with an average annual decrease of 5.9 %. The short-term decline between 2011 and 2016 was slightly slower, at an average of 4.6 % per year.

Figure 6.2: Population having neither a bath, nor a shower, nor indoor flushing toilet in their household, by country, 2011 and 2016
(% of population)



(1) Data are estimates.
(2) 2012 data (instead of 2011).
(3) Break(s) in time series between 2011 and 2016.
(4) 2015 data (instead of 2016).
(5) 2013 data (instead of 2011).

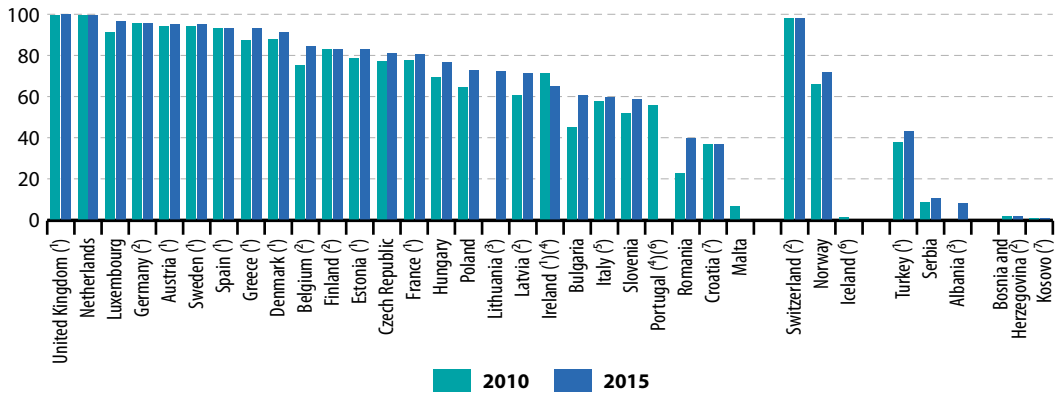
Source: Eurostat (online data code: sdg_06_10)

Population connected to at least secondary wastewater treatment

X Insufficient data to calculate trends

This indicator measures the percentage of the population connected to wastewater treatment systems with at least secondary treatment. Thereby, wastewater from urban sources or elsewhere is treated by a process generally involving biological treatment with a secondary settlement or other process, resulting in a removal of organic material that reduces the biochemical oxygen demand (BOD) by at least 70 % and the chemical oxygen demand (COD) by at least 75 %. Data presented in this section stem from the Water Statistics of the European Statistical System (ESS).

Figure 6.3: Population connected to at least secondary wastewater treatment, by country, 2010 and 2015
(% of population)



(1) 2014 data (instead of 2015).
(2) 2013 data (instead of 2015).
(3) No data for 2010.
(4) 2009 data (instead of 2010).
(5) 2008 data (instead of 2010).
(6) No data for 2015.
(7) 2011 data (instead of 2010).

Source: Eurostat (online data code: sdg_06_20)

Figure 6.3 indicates that in most Member States the percentage of the population connected to wastewater treatment systems with at least secondary treatment increased between 2010 and 2015. In 2015, connection rates ranged from below 40 % in Croatia and Romania up to 100 % in the United Kingdom.

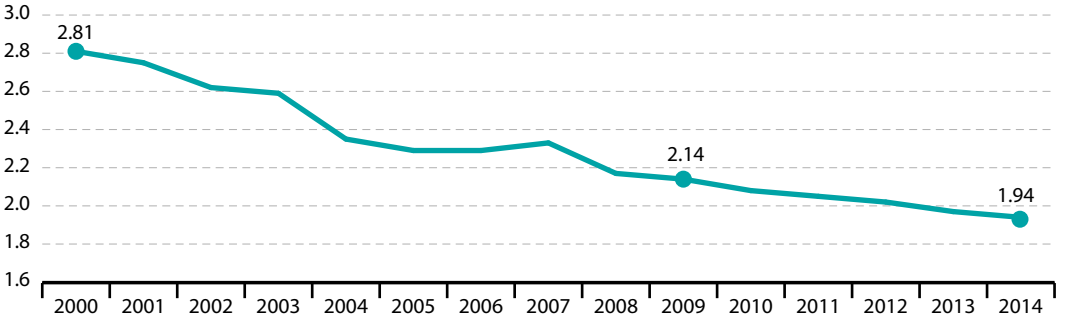
LONG TERM 2000–2014

SHORT TERM 2009–2014

Biochemical oxygen demand in rivers

This indicator measures the mean annual BOD_5 in rivers, weighted by the number of measuring stations. BOD_5 is a measure of the amount of oxygen required by aerobic microorganisms to decompose organic substances in a water sample over a period of five days in the dark at 20 °C. High BOD_5 values are usually a sign of organic pollution, which affects water quality. The cleanest rivers have a five-day BOD of less than 1 mg/L. Moderately polluted rivers show values ranging from 2 to 8 mg/L. Data presented in this section stem from the EEA Waterbase database on the status and quality of Europe's rivers.

Figure 6.4: Biochemical oxygen demand in rivers, Europe, 2000–2014
(mg O_2 per litre)

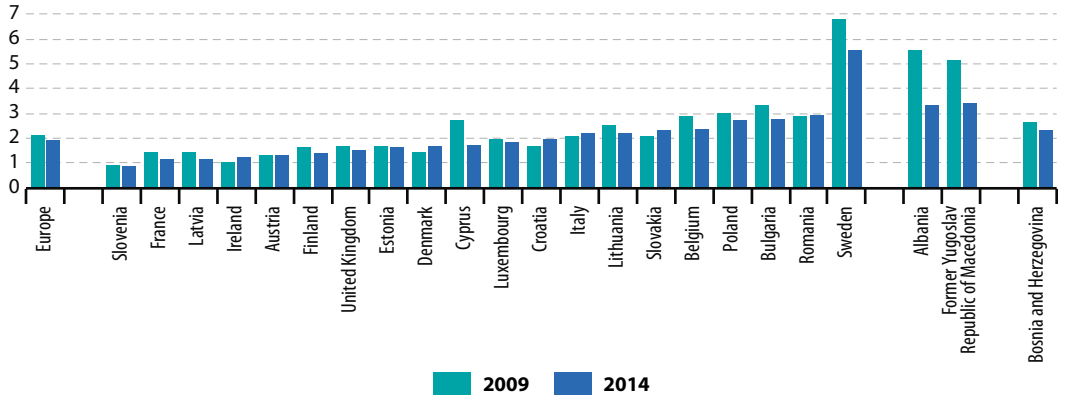


Note: 'Europe' refers to the member countries of the European Environment Agency, including the 28 EU Member States plus the EFTA countries (Iceland, Liechtenstein, Norway and Switzerland) and Albania, Bosnia and Herzegovina, Serbia and the former Yugoslav Republic of Macedonia. Data are unavailable for the Czech Republic, Germany, Greece, Hungary, Malta, Netherlands, Portugal, Spain, Iceland, Liechtenstein, Norway, Switzerland and Serbia.

Source: European Environment Agency (online data code: sdg_06_30)

The BOD in European rivers has been almost steadily decreasing since 2000, indicating that water quality has been improving. BOD levels fell by 2.6% on average between 2000 and 2014. In the short-term period between 2009 and 2014, the average yearly decline was slightly slower at 1.9%.

Figure 6.5: Biochemical oxygen demand in rivers, by country, 2009 and 2014
(mg O_2 per litre)



Source: European Environment Agency (online data code: sdg_06_30)

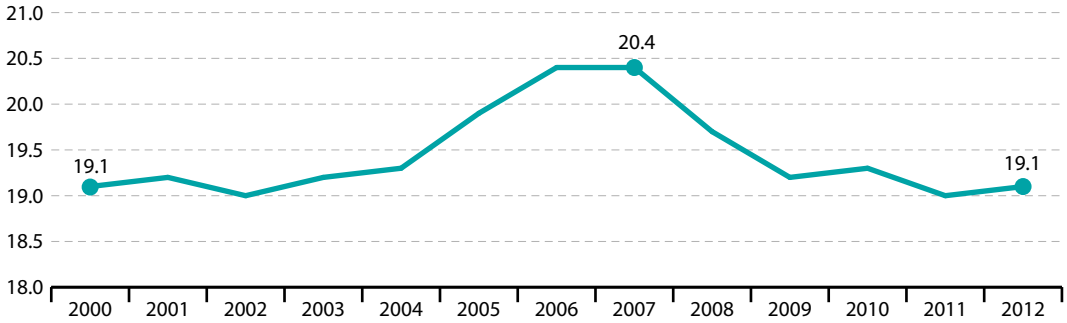
Nitrate in groundwater

LONG TERM 2000–2012

SHORT TERM 2007–2012

This indicator refers to concentrations of nitrate (NO_3) in groundwater measured as milligrams per litre (mg NO_3/L). Data are taken from well samples and aggregated to annual average concentrations for groundwater bodies in Europe. Only complete series after inter/extrapolation are included. The data stem from the EEA Waterbase database on the status and quality of Europe's rivers.

Figure 6.6: Nitrate in groundwater, Europe, 2000–2012
(mg NO_3 per litre)

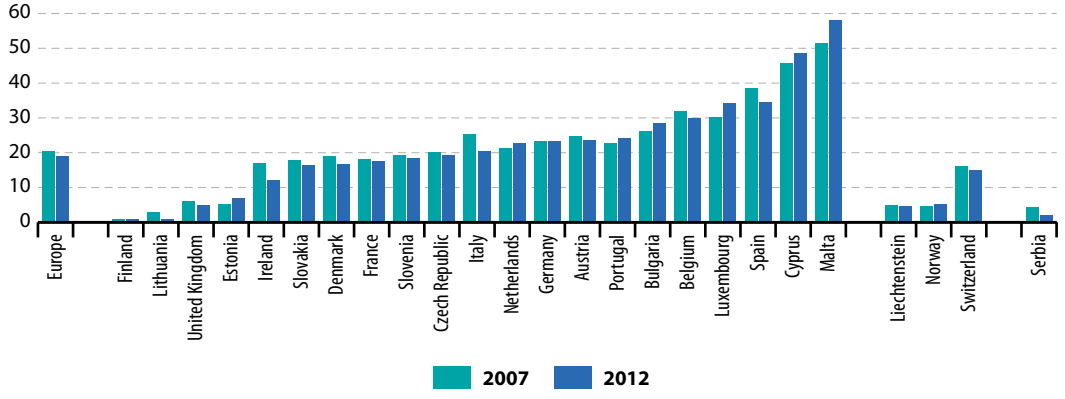


Note: 'Europe' refers to the member countries of the European Environment Agency, including the 28 EU Member States plus the EFTA countries (Iceland, Liechtenstein, Norway and Switzerland) and Albania, Bosnia and Herzegovina, Serbia and the former Yugoslav Republic of Macedonia. Data are unavailable for Greece, Croatia, Latvia, Hungary, Poland, Romania, Sweden, Iceland, Albania, Bosnia and Herzegovina, and the former Yugoslav Republic of Macedonia.

Source: European Environment Agency (online data code: sdg_06_40)

As Figure 6.6 shows, in 2012 the nitrate concentration in European groundwater was at the same level as in 2000, indicating there has been no long-term progress. However, in the short-term period between 2007 and 2012 an average annual decrease of 1.3 % was observed.

Figure 6.7: Nitrate in groundwater, by country, 2007 and 2012
(mg NO_3 per litre)



Source: European Environment Agency (online data code: sdg_06_40)

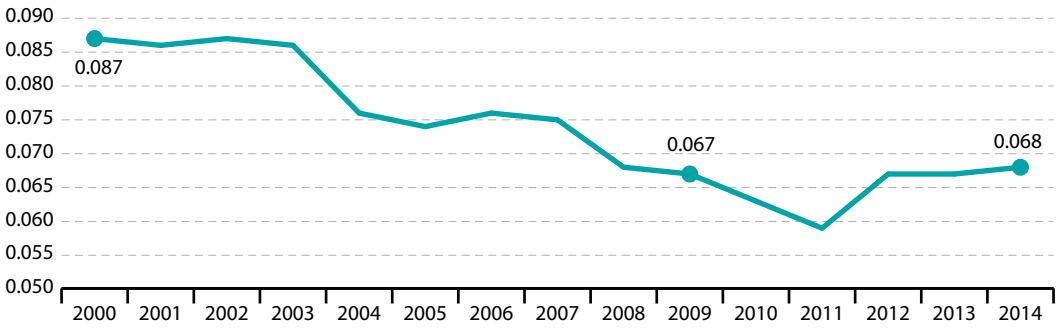
LONG TERM 2000–2014

SHORT TERM 2009–2014

Phosphate in rivers

This indicator measures the concentration of phosphate (PO_4) per litre in the dissolved phase from water samples from river stations and aggregated to annual average values. At high concentrations phosphate can cause water quality problems, such as eutrophication, by triggering the growth of macrophytes and algae. The data stem from the EEA Waterbase database on the status and quality of Europe's rivers.

Figure 6.8: Phosphate in rivers, Europe, 2000–2014
(mg PO_4 per litre)

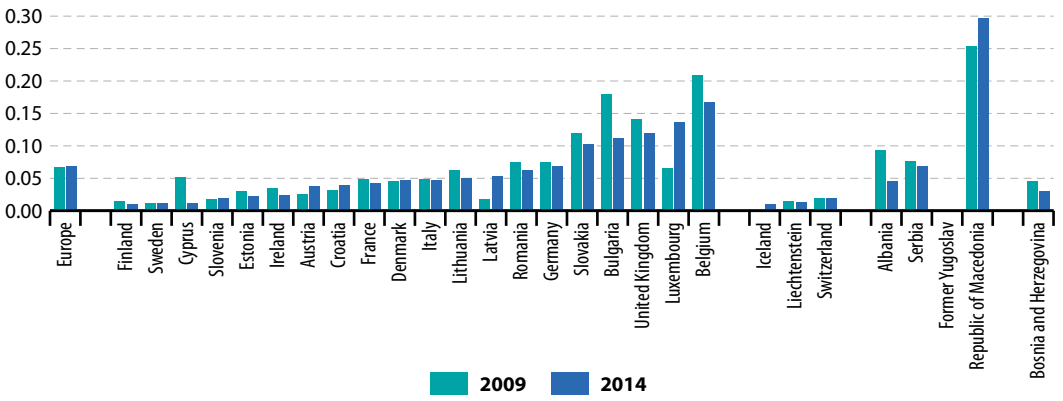


Note: 'Europe' refers to the member countries of the European Environment Agency, including the 28 EU Member States plus the EFTA countries (Iceland, Liechtenstein, Norway and Switzerland) and Albania, Bosnia and Herzegovina, Serbia and the former Yugoslav Republic of Macedonia. Data are unavailable for Czech Republic, Greece, Spain, Hungary, Malta, Netherlands, Poland, Portugal and Norway.

Source: European Environment Agency (online data code: sdg_06_50)

The average concentration of phosphate in European rivers fell significantly between 2000 and 2014, with an average annual decrease of 1.7 %. In the short-term period between 2009 and 2014, however, there was a slight average increase of 0.3 % per year.

Figure 6.9: Phosphate in rivers, by country, 2009 and 2014
(mg PO_4 per litre)



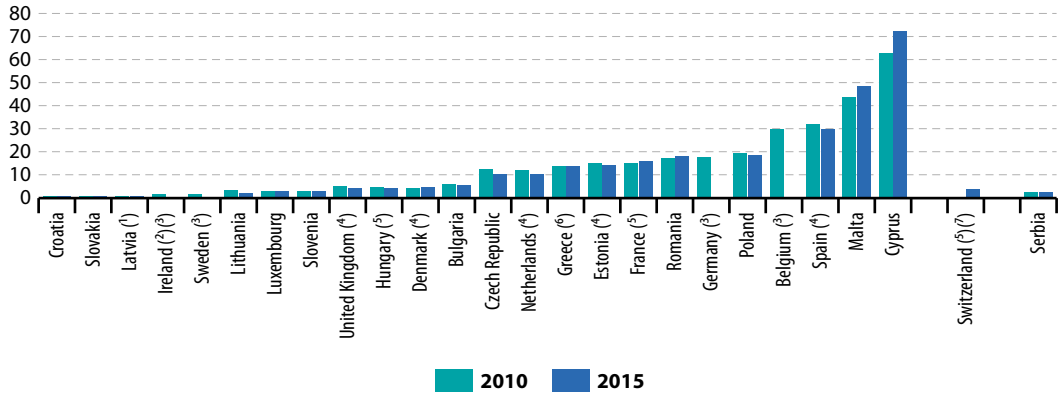
Source: European Environment Agency (online data code: sdg_06_50)

Water exploitation index

X Insufficient data to calculate trends

This indicator measures the annual total fresh water abstraction in a country as a percentage of its long-term annual average available water (LTAA) from renewable fresh water resources (groundwater and surface water). Total fresh water abstraction includes water removed from any fresh water source, either permanently or temporarily. Mine water and drainage water as well as water abstractions from precipitation are included, whereas water used for hydroelectricity generation (in situ use) is excluded. The indicator also illustrates pressure on groundwater resources. Water scarcity is noticeable above a threshold of 20 %, whereas severe scarcity regions show WEI values beyond 40 %. The indicator is based on data from the Water Statistics of the European Statistical System (ESS).

Figure 6.10: Water exploitation index, by country, 2010 and 2015
(% of long term average available water (LTAA))



(1) 2013 data (instead of 2015).
(2) 2009 data (instead of 2010).
(3) No data for 2015.
(4) 2014 data (instead of 2015).
(5) 2012 data (instead of 2015).
(6) 2011 data (instead of 2010).
(7) No data for 2010.

Source: Eurostat (online data code: sdg_06_60)

In the majority of the EU Member States for which data are available for both 2010 and 2015, there was a decrease in water exploitation index between 2010 and 2015.

Further reading on clean water and sanitation

European Environment Agency (2017), *Emissions of pollutants to Europe's waters — sources, pathways and trends*, ETC/ICM Technical Report 3/2017.

European Environment Agency (2018), *European waters — Assessment of status and pressures 2018*, ETC/ICM Technical Report No 7/2018.

UN Water (2018), *SDG 6 Synthesis Report 2018 on Water and Sanitation.*

Further data sources on clean water and sanitation

European Environment Agency, Urban waste water treatment.

European Environment Agency, Freshwater quality.

European Environment Agency, Water intensity of crop production.

European Environment Agency, Water exploitation index (WEI) and Water exploitation index+ (WEI+).

Eurostat, Water statistics.

Notes

(1) European Parliament and European Council (2013), Decision No 1386/2013/EU on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
(2) Council of the European Communities (1991), Council Directive 91/271/EEC 21 of May 1991 concerning urban waste-water treatment.
(3) Source: Eurostat (online data code: ilc_mdho05).
(4) European Parliament and Council of the European Union (2000), Directive 2000/60/EC establishing a framework for the Community action in the field of water policy.
(5) European Environment Agency (2018), *European waters — Assessment of status and pressures 2018*, EEA Report No 7/2018, p. 63.
(6) European Parliament and Council of the European Union (2000), Directive 2000/60/EC establishing a framework for the Community action in the field of water policy.
(7) European Parliament and Council of the European Union (2006), Directive 2006/7/EC concerning the management of bathing water quality and repealing Directive 76/160/EEC.
(8) European Environment Agency (2017), *Emissions of pollutants to Europe's waters — sources, pathways and trends*, ETC/ICM report, pp. 94.
(9) European Environment Agency (2018), *European waters — Assessment of status and pressures 2018*, EEA Report No 7/2018, p. 52.
(10) European Commission (2018), *The Nitrates Directive: Reports from the Commission to the Council and the European Parliament on implementation of the Nitrates Directive (Article 11 reports)*, p. 5.
(11) Council of the European Communities (1991), Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources.
(12) European Environment Agency (2018), *European Bathing Water Quality in 2017*, EEA Report No. 2/2018.
(13) European Parliament and Council of the European Union (2006), Directive 2006/7/EC concerning the management of bathing water quality and repealing Directive 76/160/EEC.
(14) Source: Eurostat (online data code: env_wat_abs).
(15) Share of 37 % on overall energy production in 2015, World Nuclear Association (2018), *Nuclear Power in Belgium*.
(16) Eurostat (2017), Statistics Explained, *Water statistics*.
(17) European Environment Agency (2017), *Water exploitation index plus (WEI+) for river basin districts (2002–2014)*.

7 Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 7 calls for ensuring universal access to modern energy services, improving energy efficiency and increasing the share of renewable energy. To accelerate the transition to an affordable, reliable and sustainable energy system that fulfils these demands, countries need to facilitate access to clean energy research and technology and to promote investment in resource- and energy-efficient solutions and low-carbon energy infrastructure.

eurostat supports the SDGs

Everyday life depends on reliable and affordable energy services, such as heating and cooling, electricity supply and transport. Energy enables the smooth functioning of all economic sectors, from business and industry to agriculture. The EU still relies heavily on fossil fuels for its energy and faces a number of challenges in securing affordable, reliable and sustainable energy supplies. Increasing energy efficiency by reducing energy consumption and improving energy productivity, while ensuring security of supply, competitiveness and access to affordable energy for all its citizens, are some of the ways the EU can contribute to the achievement of SDG 7. As reflected in the Europe 2020 strategy, increased energy efficiency and a shift towards renewable energy production are crucial for the EU, especially when considering climate change.

Table 7.1: Indicators measuring progress towards SDG 7, EU-28

Indicator		Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Energy consumption				
Energy consumption	Primary energy consumption	↗	↗	page 140
	Final energy consumption	↗	↘	
Final energy consumption in households per capita		↗	↗	page 142
Energy productivity		↑	↑	page 143
Greenhouse gas emissions intensity of energy consumption (*)		↗	↗	SDG 13, page 249
Energy supply				
Share of renewable energy in gross final energy consumption		↑ (1)	↑	page 144
Energy dependence		↘	↗	page 146
Access to affordable energy				
Population unable to keep home adequately warm		↑ (2)	↑	page 147

(*) Multi-purpose indicator.
(1) Past 12-year period.
(2) Past 10-year period; trend refers to EU-27.

Table 7.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Affordable and clean energy in the EU: Overview and key trends

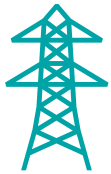
Monitoring SDG 7 in an EU context requires looking into developments in the topics of energy consumption, energy supply and access to affordable energy. As shown in Table 7.1, the EU has made moderate to significant progress in all three areas over the past few years.

Energy consumption

Increasing the EU economy's energy efficiency is one of the main pillars for reaching an affordable, reliable, sustainable and modern energy system as envisaged in SDG 7. Efficient energy systems reduce the energy intensity of products and services, lead to reduced consumption and costs, decrease dependencies and diminish the environmental and climate impacts linked to energy supply and use. To improve energy efficiency along the whole energy supply chain, the EU aims to reduce its primary and final energy consumption. Gains appear to have been made in this respect, with falls in primary and final energy consumption since 2000 more than compensating for slight increases in consumption during the period up to 2006. Despite these positive trends, primary and final energy consumption increased in 2015 and again, for the second consecutive year, in 2016, implying the EU and its Member States need to intensify efforts to meet the energy efficiency target for 2020.

The EU has made substantial progress towards its 2020 energy efficiency target, but more efforts are needed

The EU aims to increase its energy efficiency by 20 % by 2020. Because this target was set in relation to business-as-usual projections of energy consumption up to 2020, it has been translated into absolute levels of energy consumption for monitoring purposes. This means that by 2020, EU energy consumption should not exceed 1 483 million tonnes of oil equivalent (Mtoe) of primary energy or 1 086 Mtoe of final energy (see Energy Efficiency Directive ([1])). Primary energy consumption measures a country's total energy demand, covering the consumption of the energy sector itself, the losses that occur during the transformation and distribution of energy, and the final consumption by end users. In comparison, final energy consumption only covers the energy consumed by end users, such as households, industry, agriculture and transport. It excludes the energy used by the energy sector itself.



1 542.7
Mtoe of primary energy were consumed in the EU in 2016

Between 2001 and 2016, primary energy consumption decreased by 115.3 Mtoe, amounting to a 7.0 % reduction, reaching 1 542.7 Mtoe in 2016. In comparison, final energy consumption fell by only 48.8 Mtoe or 4.2 %, reaching 1 107.7 Mtoe

The EU aims to improve energy efficiency by 20 % by 2020, as highlighted in the Europe 2020 strategy ([2]), and by at least 32.5 % by 2030 according to the preliminary agreed revised Energy Efficiency Directive ([3]). The year 2005 was chosen as the base year for measuring progress towards these targets. The Energy Union strategy ([4]) includes energy efficiency as one of its five main pillars.

Furthermore, EU cohesion policy ([5]) invests EUR 29 billion in sustainable energy, including energy efficiency, renewable energy, smart energy infrastructure and low-carbon research and innovation, while the EU's digital policy ([6]) aims to contribute to energy efficiency at the household level, for example, through support for smart metering and smart cities.

in 2016. Progress on both fronts was due to various factors, including a structural transition towards less energy-intensive industries in many Member States, improvements in end-use efficiency in the residential sector and slower economic growth as a consequence of the economic crisis ([7]). An analysis of these factors points to decreased energy intensity as a result of innovation, efficiency improvements and policy implementation as being the most important drivers of reductions in primary and final energy consumption in the EU between 2005 and 2015 ([8]). Moreover, the continued decrease in primary energy consumption in the post-recession years (2009 to 2015) suggests a recent decoupling of energy consumption from economic growth ([9]). However, both primary and final energy consumption increased in 2015 and 2016, reflecting partially a return to average heating demand after an exceptionally warm 2014 ([10]). In general, the trend in final energy consumption has followed the trend in primary energy consumption, but a slightly faster rebound in 2015 and 2016 underlines the need to further pursue end use energy efficiency measures. Consequently, if this recent trend continues, it is possible that the targets for primary and final energy consumption may be missed, especially if economic growth accelerates in the future (also see the analysis of energy productivity below).

Reductions in primary energy consumption are also attributed to a fall in fossil fuel use, in particular petroleum products and solid fuels, associated with a complementary increase in the use of renewable energy sources. Although petroleum products experienced the greatest absolute reduction in consumption between 2001 and 2016 (97.8 Mtoe) — amounting to a 16.8 % reduction — they still accounted for the largest share of primary energy consumption at 31.4 %. Consumption of solid fuels fell by 82.8 Mtoe (– 25.7 %), while natural gas and nuclear heat consumption fell by 22.2 Mtoe (– 5.7 %) and 36.0 Mtoe (– 14.2 %), respectively ([11]). In contrast, the share of renewable energy sources in primary energy consumption increased between 2001 and 2016 from 6.1 % to 14.0 % (also see the analysis on renewable energy sources on page 136).

1 107.7
Mtoe of final energy were consumed in the EU in 2016

Nevertheless, reductions in primary energy consumption were mainly the result of lower final energy consumption. A breakdown by sector for final energy consumption shows that between 2001 and 2016, the greatest absolute reductions of 55.3 Mtoe (- 16.6 %) occured in the industrial sector, followed by the residential sector with 20.4 Mtoe (- 6.7 %) and agriculture/forestry with 3.4 Mtoe (- 12.2 %). Reductions in the industrial sector also compensated for increases in the service (21.3 Mtoe or + 16.5 %) and transport (19.5 Mtoe or + 5.6 %) sectors. The economic crisis, structural changes and improvements in end-use efficiency were the main drivers of the reductions. However, stronger economic growth and lower fuel costs contributed to a rebound in energy consumption in 2015 and 2016, especially in the transport sector.

In 2016, EU citizens on average consumed less energy at home than in 2001, but the decline has not been consistent

Households account for about a quarter of final energy consumption. At home, people use electricity and fuels in particular for heating, cooling, cooking, lighting, sanitary purposes and appliances. The level of household energy consumption mainly depends on outdoor temperatures (or climate conditions), building energy performance, the use and efficiency of electrical appliances, and the behaviour and potentially the economic status of inhabitants (for example, desired or affordable level of thermal comfort, frequency of clothes washing, use of TV-sets, games and lighting preferences). Over the past 15 years (2001 to 2016), the average household energy consumption per EU inhabitant has fallen significantly from 625 kilograms of oil equivalent (kgoe) to 558 kgoe — a 10.7 % reduction.

The EU's total household energy consumption was relatively stable between 2001 and 2016, while

the population grew by 4.5 % or 22 million ([12]). This suggests that efficiency improvements, in particular in space heating, may have balanced the effect of population growth. In addition, data suggest that households have reduced direct consumption of fossil fuels for heating and used more renewable energy and electricity ([13]).

11.9 %
decline in the GHG intensity of EU energy consumption between 2001 and 2016

Both energy productivity and greenhouse gas intensity of energy consumption have improved almost continuously since 2000

Historically, economies have developed in line with consumption as greater resource use spurs growth in economic output. However, recent trends in Europe point to a 'decoupling' of economic growth — measured as gross domestic product (GDP) —from energy inputs and their associated greenhouse gas (GHG) emissions. In the EU, a decoupling of energy consumption from its negative environmental and climate impacts has started to emerge, driven by declines in fossil fuels use against a backdrop of increasing renewable energy production.

558
kgoe of final energy were consumed by each EU inhabitant at home in 2016

In terms of decoupling economic growth from energy consumption, increased energy efficiency and economic restructuring result in higher energy productivity ([14]), meaning that an economy produces more output from the same energy input. Since 2000, the EU has continuously increased its energy productivity, reaching 8.4 EUR per kgoe in 2016, with all Member States contributing to this positive trend. The steady rise in the EU's energy productivity is the result of falls in gross inland energy consumption, by 7.2 % since 2001 and 3.5 % since 2011, while GDP has grown, by 21.2 % and 6.0 % over the same periods ([15]).

Energy productivity varies substantially by country, ranging from EUR 17.2 per kgoe to EUR 4.6 per kgoe ([16]). Both Malta and Ireland have significantly higher energy productivity than the remaining Member States due in part to relatively low industrial energy intensity ([17]).

In 2016, the EU's energy productivity amounted to
EUR 8.4
per kgoe

The way to decouple energy consumption from its negative contribution to climate change is to reduce its GHG intensity — the ratio between energy-related GHG emissions and gross inland consumption of energy. GHG intensity of energy consumption is thus expressed as the amount of CO_2 equivalent emitted per unit of energy consumed in a given economy.

In 2016, the majority of the EU's primary energy consumption (70.8 %) was covered by fossil energy sources, which are prime emitters of GHGs ([18]) (see also the chapter on SDG 13 'Climate Action' on page 241). Between 2001 and 2016, the GHG emissions intensity of energy consumption fell by 11.9 %, in particular due to a rising share of renewables in the energy mix and falling consumption of primarily oil products and coal. The increased use of gas in some countries has also contributed to this trend as gas and energy products derived from gas tend to be less GHG intensive.

The GHG emissions intensity also varied by country, with the largest progress being reported in Malta (39.0 %), Sweden (24.9 %) and Denmark (23.3 %). Some countries saw their GHG emissions intensity increase in the 15-year period. Lithuania and Bulgaria in particular reported 5.7 % and 6.2 % increases, respectively. The differences between countries can be attributed to numerous factors, including varying progress on energy efficiency measures, each country's respective energy mix — coal is still a significant energy source for several Member States — and pending infrastructure development (see the chapter on SDG 13 'Climate Action' on page 241 for a more detailed discussion of this indicator).

Energy supply

To achieve the SDG 7 aim of ensuring an affordable and clean energy system, the EU seeks to increase the share of renewable energy in gross final consumption of energy to 20 % by 2020. Most renewable energy sources are considered to be practically inexhaustible or renew within a human lifetime. In contrast, fossil energy sources regenerate over millions of years and are the main source of man-made GHG emissions, thus contributing significantly to climate change. The EU highlights the importance of renewable energy sources in the context of its climate change mitigation targets for the purpose of decarbonising the EU energy system (see also the chapter on SDG 13 'Climate Action' on page 239).

Additionally, to ensure a secure, affordable and clean energy system, the EU must reduce its dependency on energy imports, which mostly comprise natural gas, crude oil and coal imports. Dependence on energy imports exposes the EU economy to significant costs as well as to the risk of supply shortages, for example, due to geopolitical conflicts. In this context, the EU seeks to become more energy independent through increased domestic energy production (such as from renewable energy sources), increased energy efficiency and moderation of demand as well as through the implementation of necessary infrastructure, which will allow clean energy to be distributed across the EU. The selected indicators for this sub-theme paint an ambiguous picture: while the share of renewables in gross final energy consumption has increased continuously over the past few years, so has the EU's reliance on energy imports from outside its borders.

The EU is on track to meet its renewable energy target in 2020 due to rising shares of renewables in electricity, heating and cooling and transport

Use of renewable energy has increased continuously in the EU, with its share doubling since 2004 when renewables covered only 8.5 % of gross final energy consumption. By 2016, this figure had reached 17.0 %. Due to this steady increase the EU is well on track to meet its target of increasing the share of renewable energy to 20 % by 2020. More efficient technologies, support schemes and obligations for renewable energy sources as well as falling costs for renewable energy technologies have been the main drivers of this increase ([19]). The share of renewables increased in all of the three application areas, namely electricity, heating and cooling, and transport. In 2016, the renewable share was highest in electricity generation at 29.6 %. This was followed by heating and cooling, where renewables supplied 19.1 % and transport with 7.1 %. Since 2004, the share of renewable energy in transport has increased fivefold, up from only 1.4 %. The second largest increase was realised in electricity generation where renewables doubled their share, followed by heating and cooling where their share increased by 8.8 percentage points ([20]).

17.0 %
of the energy consumed in the EU in 2016 came from renewable sources

Renewable energy can be generated from a range of sources, including bioenergy, hydro, wind, solar and geothermal power. In 2016, renewable electricity was generated predominantly by hydropower and wind energy, while biomass supplied most of the renewable heating. Bioenergy (biomass and renewable

The Europe 2020 strategy ([21]) sets the target to increase the share of renewable energy sources in final energy consumption to 20 % by 2020. By 2030, the share should further increase to at least 32 % according to the 2030 Climate and Energy Policy Framework ([22]). The Energy Union strategy ([23]) highlights the aim of the European Union to become a world leader in renewable energy sources. EU cohesion policy (2014 to 2020) ([24]) invests EUR 29 billion in sustainable energy, including energy efficiency, renewable energy, smart energy infrastructure and low-carbon research and innovation.

waste) remained by far the EU's most important renewable energy source and contributed to all three aforementioned major energy use sectors, providing 64.8 % of the total gross inland consumption of renewable energy in 2016 ([25]). Liquid biofuels were also the main source of renewable transport fuels. Hydropower accounted for 13.9 %, with wind (on- and off-shore) and solar (photovoltaic and thermal) energy contributing 12.0 % and 6.2 %, respectively. The smallest share was geothermal energy at 3.1 % of total gross inland consumption ([26]).

In 2016, there were wide variations among Member States in the share of renewable energy in gross final energy consumption, depending on the available renewable sources and the financial and regulatory support provided. Sweden had a substantial lead with a share of 53.8 % followed by Finland and Latvia with shares of 38.7 % and 37.2 %, respectively. These particularly high shares were reached through the use of hydropower and solid biofuels. Still, wind and solar energy have also increasingly contributed to the growth of renewable energy in final energy consumption in most EU countries.

Imports of crude oil, natural gas and hard coal have been expanding since 2001 to meet the EU's energy demand

Despite the continuous expansion of renewable energy sources over the past decade, the EU has increasingly relied on fuel imports from non-EU countries to meet its energy demands. As a consequence, the EU's energy dependence has increased significantly over the past two decades as the domestic primary production of many energy sources (hard coal, lignite, crude oil, natural gas and more recently nuclear energy) has declined ([27]). In 2001, 47.3 % of the energy consumed within the EU was imported from outside, but by 2016 the share increased to 53.6 %. Imports of fossil energy carriers, such as petroleum products (86.7 % imported), natural gas (70.4 % imported) and solid fuels, such as hard coal (40.2 % imported), were primarily responsible for the increased energy dependence, which can be explained by exhausted or uneconomic domestic sources ([28]). Bioenergy imports, predominantly of biofuels and biomass, accounted for 11.7 % of gross inland consumption of bioenergy in 2016 ([29]). It is not always possible to ensure the sustainability of bioenergy imports, which can lead to negative environmental effects if harvested unsustainably. In contrast, most other forms of renewable energy are sourced solely domestically, thus lessening the import dependence. The total energy imported as a share of total energy consumption decreased marginally by 0.3 percentage points between 2015 and 2016.

53.6 %
of the energy consumed in the EU in 2016 was imported

The Energy Security Strategy ([30]) outlines the need to enhance domestic energy production, including the need to increase local renewable energy production, energy efficiency and provide missing infrastructure. The Energy Union strategy ([31]) highlights energy security as one of its five pillars.

The main supplier of energy to the EU in 2016 continued to be Russia, which accounted for 40.2 % of gas imports, 34.6 % of imports of petroleum products and 30.2 % of solid fuel imports from outside the EU. After Russia, the second largest supplier of gas were European countries that are not part of the EU (mainly Norway), which delivered 25.1 % of gas imports. Regarding petroleum products, the Middle East and Africa were the next largest suppliers after Russia, at 19.9 % and 14.0 %, respectively. The second largest source for solid fuels was Central and South America at 23.5 %, followed by North America with 16.1 % ([32]). All percentages reported here refer to shares of total imports from outside the EU only and thus do not account for energy traded between EU Member States.

In 2016, all Member States were net importers of energy, with 14 Member States importing

more than half of their total energy consumption from other countries (EU countries and non-EU countries). Countries with the highest shares of imports in 2016 were Luxembourg (96.1 %), Italy (77.5 %), Lithuania (77.4 %), Belgium (76.0 %) and Greece (73.6 %) as well as the island countries Cyprus and Malta, which covered virtually all of their energy needs with imports. The largest increases over the past 15 years took place in Denmark and the UK, both of which were net exporting countries (of petroleum products and gas) in 2001 but in the year 2016 were net importers. Denmark was still a net exporter of gas but had to import petroleum products, while the UK was a net importer of petroleum products and of gas in 2016.

The greatest progress in reducing energy dependence was observed in Estonia. This was realised through increases in domestic production of solid fuels and petroleum products, which allowed it to reduce imports while increasing its own consumption. Sweden in contrast reduced its dependence by increasing the share of renewable energy in its gross inland consumption to the detriment of imported fossil fuels, which simultaneously allowed the country to reduce its emissions of GHGs related to energy use.

Access to affordable energy

SDG 7 emphasises the need for affordable energy for reasons of social equality and justice. The inability to keep the home adequately warm is a survey-based indicator used to monitor access to affordable energy throughout the EU. A lack of access to affordable energy is strongly associated with low levels of income, and therefore, reducing overall poverty has the capacity to greatly improve access to affordable energy (see also the chapter on SDG 1 'No poverty' on page 35).

The EU has continued to make some progress on increasing access to affordable energy since 2012 following setbacks due to the economic crisis

After the setbacks of the economic crisis and its impacts on employment, wage levels and social payments, which led to an intermittent increase in the rate of people who reported an inability to keep the home adequately warm, the EU has made some progress on improving access to affordable energy. In 2017, 8.2 % of the EU population indicated a lack of access to affordable energy — 2.7 percentage points lower than in 2007 ([33]). Gains were being made until the onset of the economic crisis in 2008, which caused a rise in unemployment and put pressure on wage levels and social payments. This resulted in rising indicator values in many Member States until 2012 when they reached almost the same levels as in 2007. After 2012, the inability to keep one's home

8.2 %
of the EU population were unable to keep their home adequately warm in 2017

The EU Cohesion Policy (2014–2020) ([34]) provides about EUR 350 billion in investments into smart, sustainable and inclusive growth from 2014 to 2020. One of its objectives is to combat poverty through housing investments and the regeneration of deprived urban and rural areas.

At the beginning of 2018, the European Commission launched the EU Energy Poverty Observatory ([35]), an initiative to aid Member States in their efforts to decrease energy poverty and ensure access to affordable energy. An online data platform seeks to improve monitoring, measuring and the sharing of best practices on combatting energy poverty between countries.

The Energy Union strategy ([36]) was established to ensure that Europe has access to secure, affordable and climate-friendly energy.

adequately warm became less prevalent with steady reductions each year.

The ability to keep the home adequately warm depends greatly on income. People who are at risk of poverty are also likely to find energy difficult to afford (see also the chapter on SDG 1 'No poverty', on page 35). In 2016, 21.0 % of people with an income below 60 % of the median equivalised income (the 'poverty threshold') reported being unable to keep their homes adequately warm — down 1.7 percentage points from the year before. At the same time, only 6.1 % of people with an income above 60 % of the median equivalised income reported a lack of access to affordable energy. Household type (for example, single, elderly occupants, households with dependent children) has a limited effect on the indicator. However, among single households with dependent children, 13.3 % reported being unable to keep their home adequately warm ([37]).

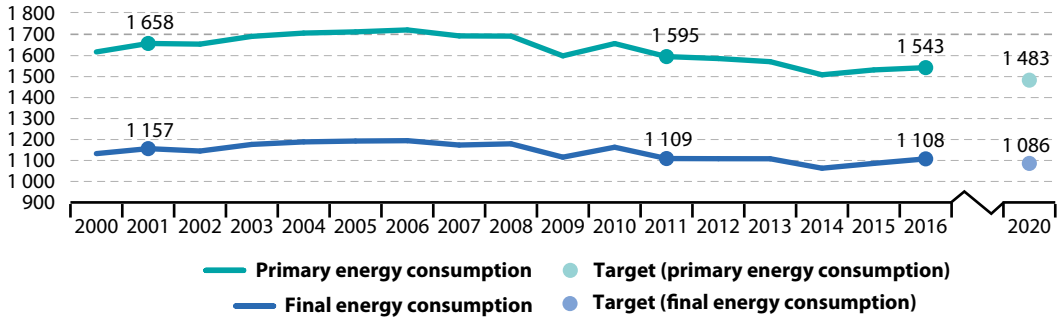
In 2016, 19 Member States indicated that less than 10 % of their population reported an inability to keep their homes adequately warm. Northern and most western European countries, with particularly cold winters, had the lowest shares of people without access to heating. In contrast, lack of access to affordable heating seemed to be a widespread problem in southern and eastern Europe ([38]). This distribution can be traced back mainly to building efficiency, including the lack of suitable heating systems and insulation predominantly in southern countries, leading to low indoor temperatures during winter; the general income level which affects housing standards and ability to pay for fuels and the existence and design of financial interventions by the respective governments ([39]).

Presentation of the main indicators

Energy consumption

Primary energy consumption measures a country's total energy demand, which includes consumption of the energy sector itself, losses that occur during the transformation and distribution of energy and final energy consumption by end users. In comparison, final energy consumption only measures the energy consumed by end users, such as households, industry, agriculture and transport.

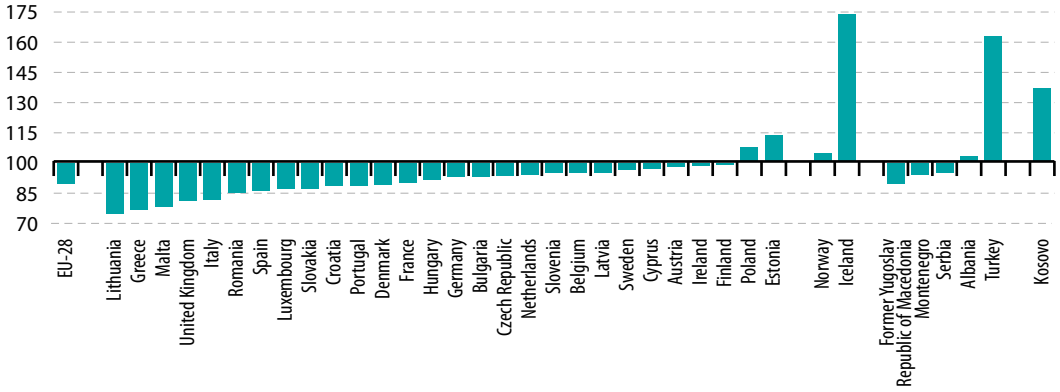
Figure 7.1: Primary and final energy consumption, EU-28, 2000–2016
(million tonnes of oil equivalent (Mtoe))



Source: Eurostat (online data code: sdg_07_10 and sdg_07_11)

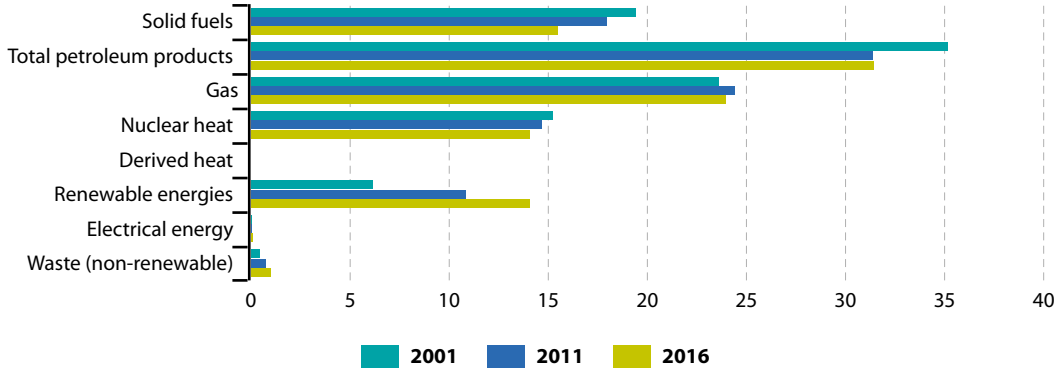
Figure 7.1 shows the EU reduced its primary energy consumption by 7.0 % between 2001 and 2016. The annual average decrease amounted to 0.5 % between 2001 and 2016 and 0.7 % in the short-term period 2011 to 2016. Final energy consumption decreased by just 4.2 % between 2001 and 2016, with average annual decreases of 0.3 % and 0.03 % in the long and short term, respectively. While the long-term analysis indicates the EU is on track to meet both targets, the short-term (five-year) trend for final energy consumption suggests progress has slowed enough in recent years to risk missing the target.

Figure 7.2: Change in primary energy consumption, by country, 2016
(Index 2005 = 100)



Source: Eurostat (online data code: sdg_07_10)

Figure 7.3: Primary energy consumption, by fuel type, EU-28, 2001, 2011 and 2016
(% of fuel types in total consumption)



Source: Eurostat (online data code: nrg_100a)

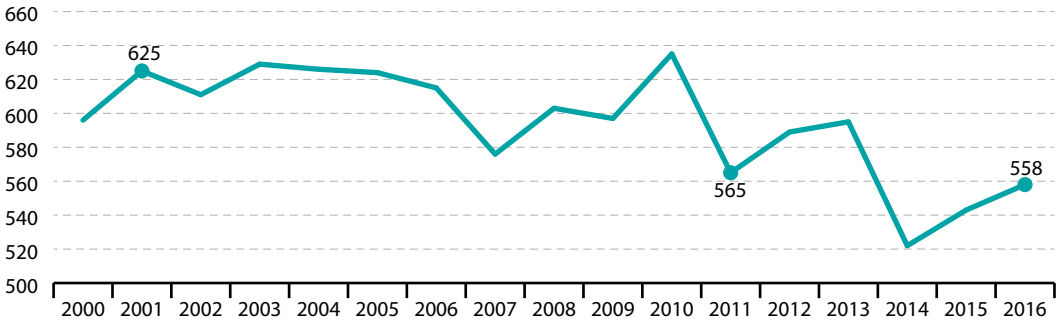
LONG TERM 2001–2016

SHORT TERM 2011–2016

Final energy consumption in households per capita

The final energy consumption per capita in households measures how much electricity, heat, petroleum products and natural gas each citizen consumes at home, excluding transport. Data are not temperature-adjusted; thus, year-to-year variations are due in part to weather.

Figure 7.4: Final energy consumption in households per capita, EU-28, 2000–2016
(kgoe)

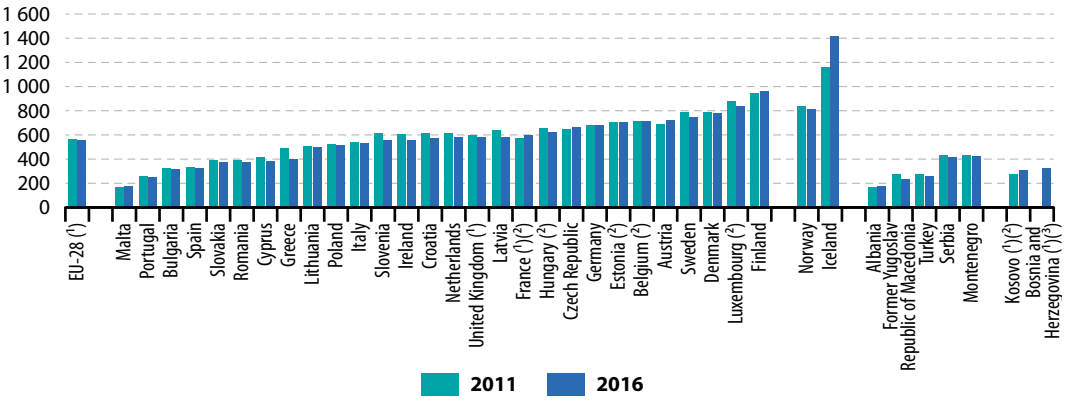


Note: Breaks in time series for population data; 2012–2016 data are (provisional) estimates.

Source: Eurostat (online data code: sdg_07_20)

Figure 7.4 shows a fluctuating but overall decreasing trend in the per capita energy consumption of European households. For the observed long- and short-term periods, the average declines amounted to 0.8 % per year between 2001 and 2016 and 0.2 % per year between 2011 and 2016.

Figure 7.5: Final energy consumption in households per capita, by country, 2011 and 2016
(kgoe)



(1) 2016 data are estimates and/or provisional.
(2) Break(s) in time series between 2011 and 2016.
(3) No data for 2011.

Source: Eurostat (online data ode: sdg_07_20)

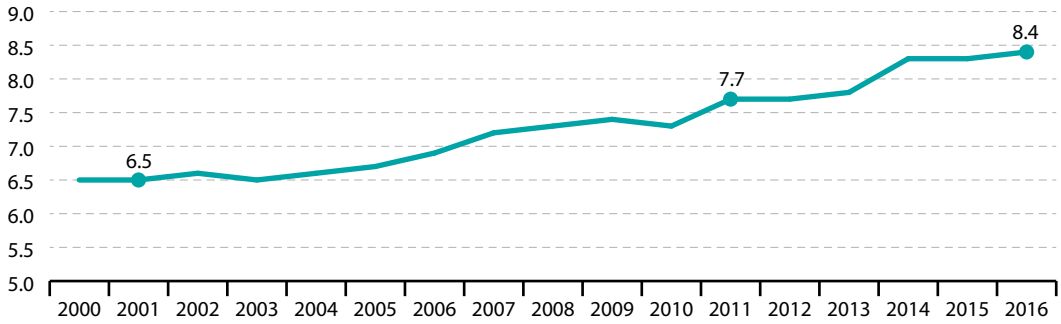
Energy productivity

LONG TERM 2001–2016

SHORT TERM 2011–2016

The energy productivity indicator measures the amount of economic output produced per unit of gross inland energy consumption. The gross inland energy consumption is the primary energy consumption plus energy carriers employed for non-energy purposes. Economic output is either given as euros in chain-linked volumes to the reference year 2010 at 2010 exchange rates (Figure 7.6) or in the unit PPS (purchasing power standards) (Figure 7.7) ([40]).

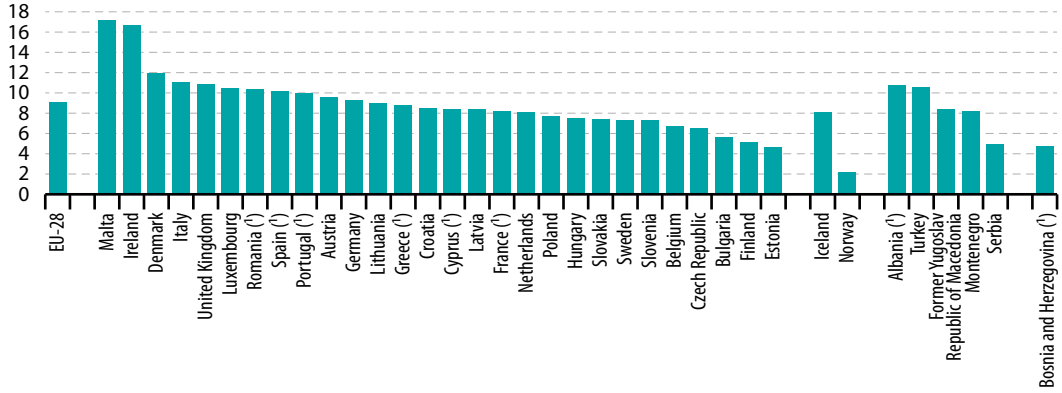
Figure 7.6: Energy productivity, EU-28, 2000–2016
(EUR per kgoe)



Source: Eurostat (online data code: sdg_07_30)

Figure 7.6 shows that overall energy productivity has steadily increased in the EU since 2000. The average annual long-term growth rate in the period 2001 to 2016 amounts to 1.7 %. The yearly growth rate was slightly faster at 1.8 % in the short-term period, from 2011 to 2016.

Figure 7.7: Energy productivity, by country, 2016
(PPS per kgoe)



(1) Provisional data.

Source: Eurostat (online data code: sdg_07_30)

LONG TERM 2004–2016

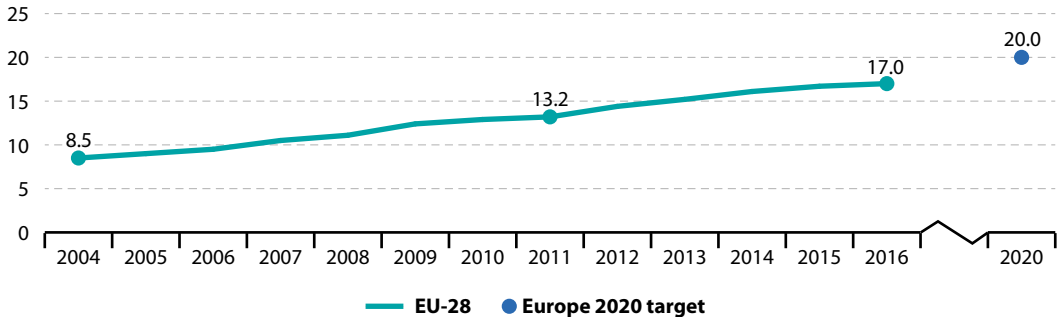
SHORT TERM 2011–2016

Share of renewable energy in gross final energy consumption

Renewable energy generation is given as the share of renewable energy consumption in gross final energy consumption, according to the Renewable Energy Directive ([41]). The gross final energy consumption is the energy used by end consumers (final energy consumption) plus grid losses and self-consumption of power plants.

Figure 7.8: Share of renewable energy in gross final energy consumption, EU-28, 2004–2016

(%)

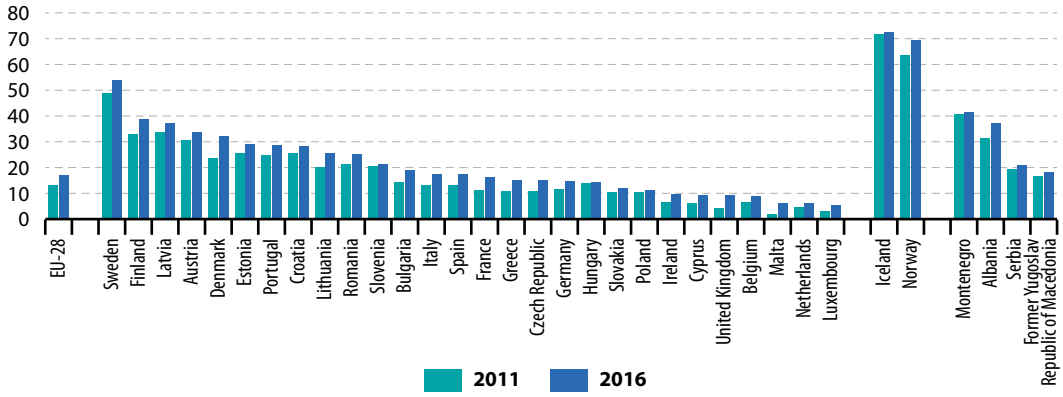


Source: Eurostat (online data code: sdg_07_40)

The use of renewable energy has increased continuously in the EU, with its share doubling since 2004 when renewables covered only 8.5 % of gross final energy consumption. In the period 2004 to 2016, the share of renewable energy grew annually by 5.9 % on average. The yearly growth slowed down slightly to 5.2 % in the short-term period 2011 to 2016.

Figure 7.9: Share of renewable energy in gross final energy consumption, by country, 2011 and 2016

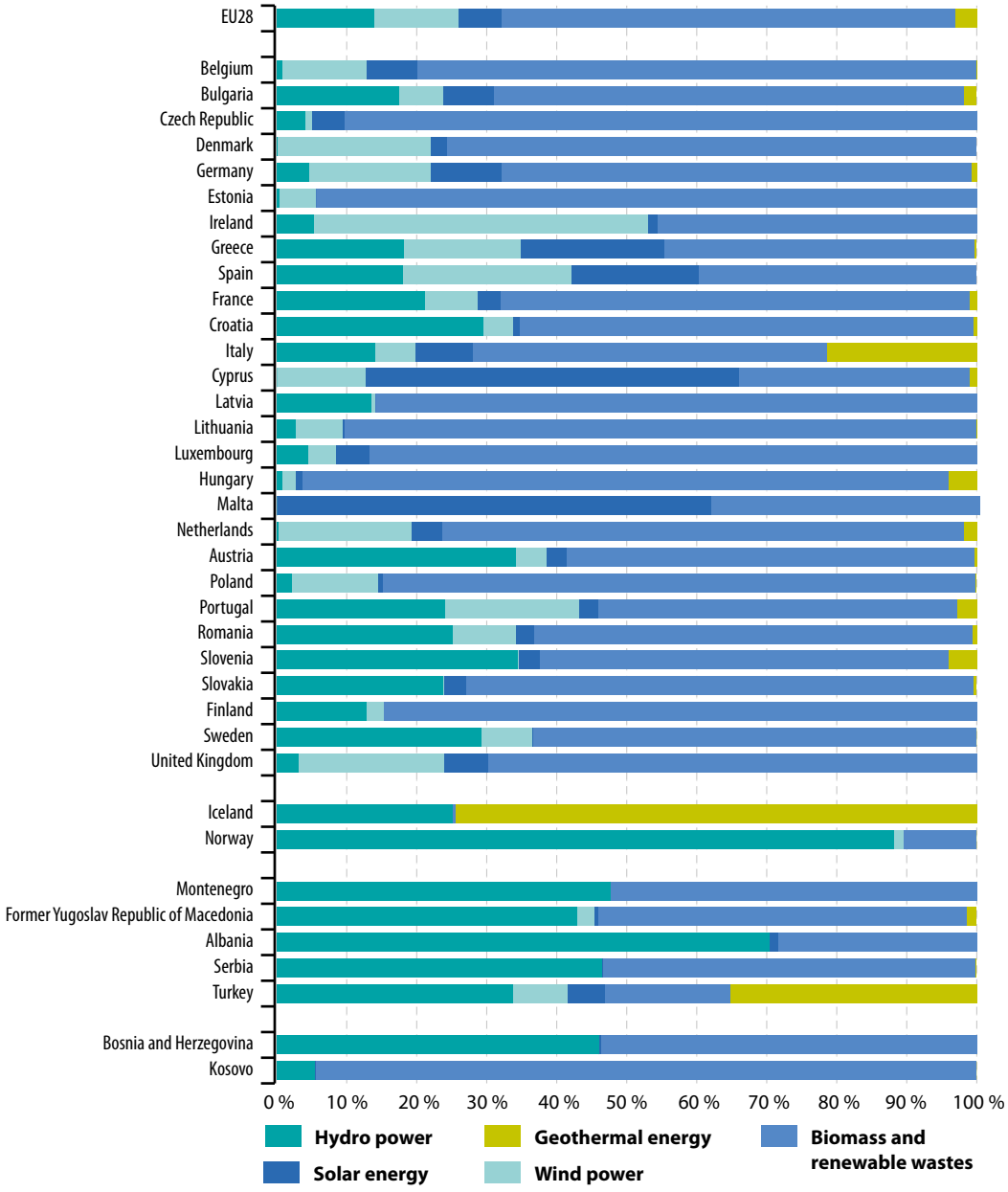
(%)



Source: Eurostat (online data code: sdg_07_40)

Renewable energy can be generated from a range of sources and the consumption of renewable energy by type varies greatly between Member States. Figure 7.10 provides an overview of the distribution of renewable energy types in gross inland consumption within Member States in 2016.

Figure 7.10: Gross inland consumption of renewable energy, by source, by country, 2016 (% of total renewable energy)



Source: Eurostat (online data code: nrg_107a)

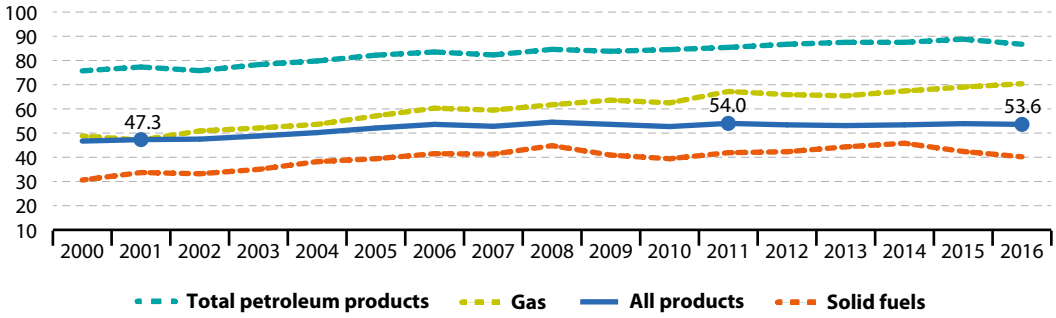
LONG TERM 2001–2016

SHORT TERM 2011–2016

Energy dependence

Energy dependence is the share of total inland energy needs met by imports from other countries. Dependence on imports of energy carriers exposes the European economy to volatile world market prices and the risk of supply shortages, for example due to geopolitical conflicts. The risks increase with dependency on single countries, which is often a result of the supply infrastructure in place.

Figure 7.11: Energy dependence, by product, EU-28, 2000–2016
(% of imports in total energy consumption)

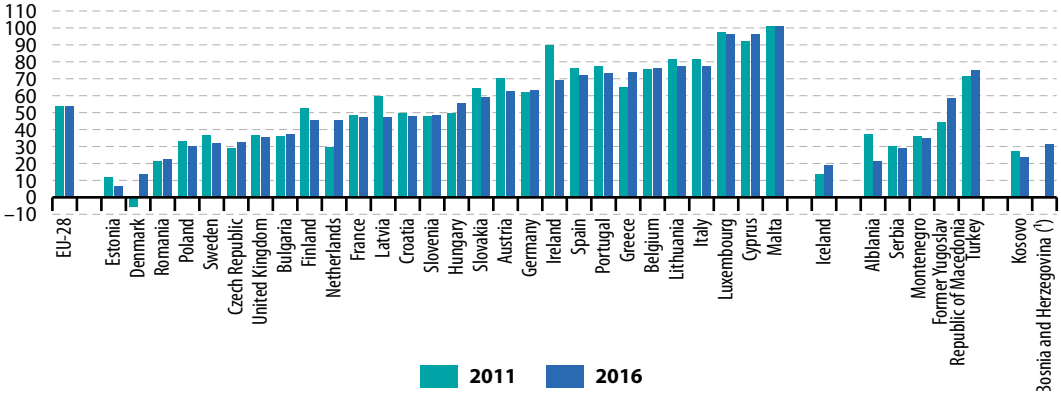


Note: 'All products' is not the average of the other three fuel categories shown. It also includes other energy sources, such as renewable energy or nuclear energy, which are treated as domestic sources.

Source: Eurostat (online data code: sdg_07_50)

The EU's energy dependence has increased significantly over the past two decades as domestic primary production of hard coal, lignite, crude oil, natural gas and more recently nuclear energy has declined ([42]). The long-term average annual growth over the period 2001 to 2016 amounts to 0.8 %. However, more recently, in the last five years, energy dependence has decreased by an average of 0.1 % annually.

Figure 7.12: Energy dependence, by country, 2011 and 2016
(% of imports in total energy consumption)



(1) No data for 2011.

Source: Eurostat (online data code: sdg_07_50)

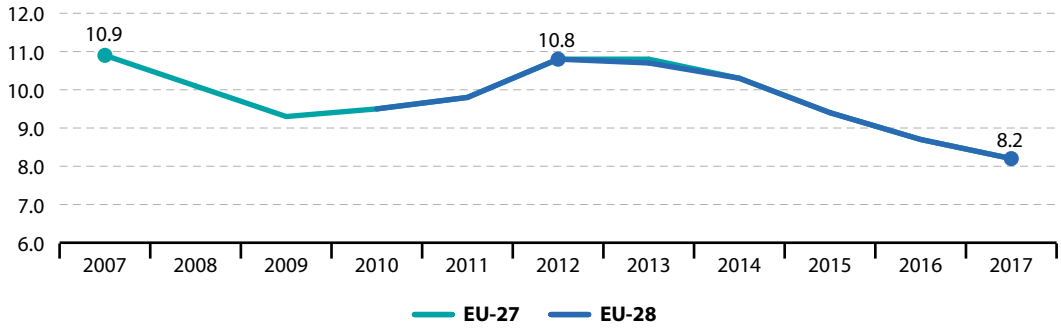
Population unable to keep home adequately warm

LONG TERM 2007–2017

SHORT TERM 2012–2017

This indicator monitors access to affordable energy throughout the EU. The data are collected as part of the European Union Statistics on Income and Living Conditions (EU-SILC) to monitor the development of poverty and social inclusion in the EU. Data collection is based on a survey, which means that indicator values are self-reported.

Figure 7.13: Population unable to keep home adequately warm, EU-27 and EU-28, 2007–2017
(% of population)

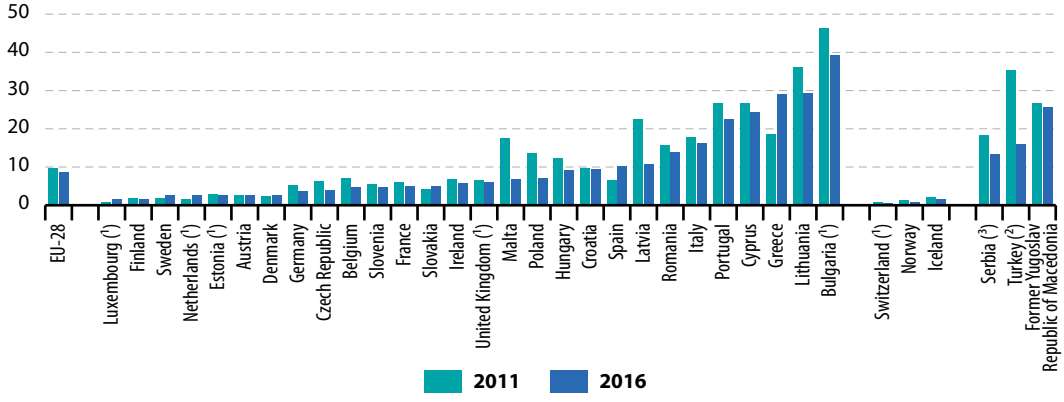


Note: 2017 data are estimates.

Source: Eurostat (online data code: sdg_07_60)

As depicted in Figure 7.13, 8.2 % of the EU population were unable to keep home adequately warm in 2017, down 2.7 percentage points from 2007 ([43]). The share of the population affected decreased by 5.4 % annually over the last five years on average and by 2.8 % annually over the last ten years.

Figure 7.14: Population unable to keep home adequately warm, by country, 2011 and 2016
(% of population)



(1) Break(s) in time series between 2011 and 2016.
(2) 2015 data (instead of 2016).
(3) 2013 data (instead of 2011).

Source: Eurostat (online data code: sdg_07_60)

Further reading on affordable and clean energy

Bouzarovski, S. and Tirado-Herrero, S. (2017), *The energy divide: Integrating energy transitions, regional inequalities and poverty trends in the European Union*, European Urban and Regional Studies; 24: pp. 69–86.

European Commission (2017), *Third report on the State of the Energy Union*, COM(2017) 688 final, Brussels.

European Commission (2017), *Energy efficiency progress report*, COM(2017) 687 final, Brussels.

European Commission (2017), *Renewable energy progress report*, COM(2017) 57 final, Brussels.

European Environment Agency (2017), *Trends and projections in Europe 2016 — Tracking progress towards Europe's climate and energy targets*, Report No. 17/2017, Copenhagen, EEA.

European Environment Agency (2017), *Renewable energy in Europe — 2017 Update*, Report No. 23/2017, Copenhagen, EEA.

Pye, S and Dobbins, A (2015), *Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures*, Insight_E.

Further data sources on affordable and clean energy

European Commission, EU Energy Poverty Observatory.

Eurostat, Energy from renewable sources — Statistics explained.

Eurostat, Energy production and imports — Statistics explained.

Eurostat, Energy trends — Statistics Explained.

Eurostat, Europe 2020 indicators — Climate change and energy.

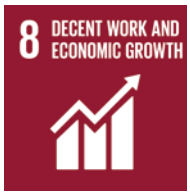
Notes

(1) European Parliament and Council of the European Union (2012), Directive 2012/27/EU on energy efficiency and Council of the European Union (2013), Directive 2013/12/ EU of 13 May 2013 adapting Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, by reason of the accession of the Republic of Croatia.
(2) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
(3) European Commission (2018), *Energy efficiency first: Commission welcomes agreement on energy efficiency*, Press Release Database.
(4) European Commission (2015), *A framework strategy for a resilient Energy Union with a forward-looking climate change policy*, COM(2015) 80 final, Brussels.
(5) European Commission (2015), *European structural and investment funds 2014–2020: Official texts and commentaries*, Brussels.
(6) European Commission (2015), *A digital single market strategy for Europe*, COM(2015) 192 final, Brussels.
(7) European Environment Agency (2017), *Trends and projections in Europe 2017 — Tracking progress towards Europe's climate and energy targets*.
(8) Economidou, M. (2017), *Assessing the progress towards the EU energy efficiency targets using index decomposition analysis*, EUR 28710 EN, Joint Research Centre, Luxembourg: Publications Office of the European Union.
(9) European Commission (2017), Energy efficiency progress report, COM(2017) 687 final, Brussels, p. 1.
(10) Ibid, p. 10.
(11) Source: Eurostat (online data code: nrg_100a).
(12) Source: Eurostat (online data code: demo_gind).
(13) Source: Eurostat (online data code: t2020_rk210).
(14) Energy productivity is defined as GDP per unit of gross inland energy consumption, measured in EUR per kg of oil equivalent. Part of the energy considered is consumed by households, which means that it is not used as an input to production activities. Thus, energy productivity is not directly comparable to concepts such as labour or capital productivity. Note that the indicator's inverse is energy intensity.
(15) Source: Eurostat (online data codes: nrg_100a and nama_10_gdp).
(16) For purposes of comparison EUR units are expressed as the purchasing power standard (PPS).
(17) Odyssee-Mure (2018), Key indicators on energy efficiency.
(18) Source: Eurostat, simplified energy balances (online data code: nrg_100a).
(19) European Commission (2017), Renewable energy progress report, COM(2017) 57 final, Brussels, p. 2.
(20) Source: Eurostat (online data code: nrg_ind_335a).
(21) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
(22) European Commission (2014), *A policy framework for climate and energy in the period from 2020 to 2030*, COM(2014) 15 final, Brussels.
(23) European Commission (2015), *A framework strategy for a resilient Energy Union with a forward-looking climate change policy*, COM(2015) 80 final, Brussels.
(24) European Commission (2015), *European structural and investment funds 2014-2020: Official texts and commentaries*, Brussels.
(25) In this chapter, 'bioenergy' refers to the Eurostat product category 'biomass and renewable waste' (code: 5540), which includes 'solid biofuels (excluding charcoal)' (code: 5541), 'biogas' (code: 5542), 'municipal waste (renewable)' (code: 55431), 'charcoal' (code: 5544) and 'liquid biofuels' (code: 5545).
(26) Source: Eurostat (online data code: nrg_107a).
(27) Eurostat (2018), *Statistics explained: Energy production and imports*.
(28) Import shares for natural gas were calculated in cubic meters; solid fuel and oil import shares were calculated in tonnes.
(29) Source: Eurostat (online data code: nrg_107a).
(30) European Commission (2014), *European energy security strategy*, COM(2014) 330 final, Brussels.
(31) European Commission (2015), *A framework strategy for a resilient Energy Union with a forward-looking climate change policy*, COM(2015) 80 final, Brussels.
(32) Source: Eurostat (online data codes: nrg_122a, nrg_123a and nrg_124a).
(33) Source: Eurostat (online data code: ilc_mdes01); data in 2007 refer to EU-27.
(34) European Commission (2015), *European structural and investment funds 2014-2020: Official texts and commentaries*, Brussels.
(35) European Commission (2018), *EU Energy Poverty Observatory.*
(36) European Commission (2015), *A framework strategy for a resilient Energy Union with a forward-looking climate change policy*, COM(2015) 80 final, Brussels.
(37) Source: Eurostat (online data code: ilc_mdes01).
(38) Bouzarovski, S. and Tirado-Herrero, S. (2017), *The energy divide: Integrating energy transitions, regional inequalities and poverty trends in the European Union*, European Urban and Regional Studies; 24: pp. 69–86.
(39) Pye, S. and Dobbins, A. (2015), *Energy poverty and vulnerable consumers in the energy sector across the EU: Analysis of policies and measures*, Insight_E; Andrei, A-C. (2015), *Energy poverty — Proved of the effectiveness of the public heating systems?* In: Proceedings of the 9th international management conference 'Management and innovation for competitive advantage', Bucharest, Romania.

(40) To compare Member States, PPS are used instead of euros to adjust for price level differences. There are large disparities in energy productivity, ranging from 4.6 to 16.8 PPS per kilogram of oil equivalent. However, differences do not necessarily result only from differences in countries' efficiency levels, but can also reflect a country's economic specialisation, for example, energy-intensive industries or service-based economies.
(41) European Parliament and Council of the European Union (2009), Directive 2009/28/EC on the promotion of the use of energy from renewable sources.
(42) Eurostat (2018), *Statistics explained: Energy production and imports*.
(43) Data in 2007 refer to EU-27.

8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 8 recognises the importance of sustained economic growth and high levels of economic productivity for the creation of well-paid quality jobs as well as resource efficiency in consumption and production. It calls for providing opportunities for full employment and decent work for all while eradicating forced labour, human trafficking and child labour, and promoting labour rights and safe and secure working environments.



eurostat supports the SDGs

Economic growth and decent employment are of key importance for the development and prosperity of European countries and for the well-being and personal realisation of individuals. For economic growth to be sustainable, it needs to be accompanied by eco-efficiency improvements, social inclusion policies and sustainable economic models such as a social economy, in order to avoid harming the natural environment it depends on, damaging the social fabric of European countries or undermining the well-being of future generations. Sustainable economic growth thus also means generating employment opportunities for all and improving working conditions for those already in employment.

Table 8.1: Indicators measuring progress towards SDG 8, EU-28

Indicator	Long-term trend past 15 years)	Short-term trend (past 5 years)	Where to find out more
Sustainable economic growth			
Real GDP per capita	↑	↑	page 159
Investment share of GDP	↘	↗	page 160
Resource productivity (*)	↑	↑	SDG 12, page 227
Employment			
Young people neither in employment nor in education or training	↑	↑	page 161
Employment rate	↗	↗	page 162
Long-term unemployment rate	↑ (1)	↑	page 163
Inactive population due to caring responsibilities (*)	↓ (2)(3)	↓ (2)	SDG 5, page 110
Decent work			
People killed in accidents at work	:	↑	page 164
In work at-risk-of-poverty rate (*)	↓ (3)(4)	↓	SDG 1, page 43

(*) Multi-purpose indicator.
(1) Past 12-year period.
(2) Trend refers to evolution of gender gap
(3) Past 11-year period
(4) Trend refers to EU-27.

Table 8.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Decent work and economic growth in the EU: overview and key trends

Monitoring SDG 8 in an EU context looks into trends in the areas of sustainable economic growth, employment and decent work. As Table 8.1 shows, the EU has achieved some progress in terms of sustainable economic growth over the past few years. While the overall employment situation and working conditions have also improved, a gender gap in labour market participation persists and the economic security of the working population still remains an issue.

Sustainable economic growth

Economic growth contributes to society's well-being by enabling people to make a decent living and to enjoy high living standards. While it is an important driver of prosperity, economic growth might also harm the environment it depends on. Therefore, for future well-being it is crucial to pursue sustainable economic growth that tries to satisfy the needs of the present generation in a manner that sustains natural resources and the environment for future generations. The indicators selected to monitor these aspects show that over the past few years Europeans have been enjoying moderate economic growth, which has also become more sustainable.

The EU economy has shown moderate growth

Citizens' living standards depend on the economic performance of the EU, which can be measured by several indicators. One of these is growth in gross domestic product (GDP), which is commonly used as a proxy for measuring a country's socio-economic development. Although GDP is not a complete measure of welfare, it gives an indication of an economy's potential to satisfy people's needs and its capacity to create jobs. It can also be used to monitor economic development.

Real GDP per capita (GDP adjusted for inflation) in the EU in 2017 reached EUR 27 700, which was 16.9 % higher than in 2002. After the severe economic slump in 2009, real GDP per capita was slowly recovering and almost reached its pre-crisis level in 2014. On average, GDP per capita has been increasing by 1.3 % per year since 2009. In 2017, real GDP per capita in the EU grew by 2.2 %, which was the highest annual growth rate in ten years. It is expected that in 2018 the European economy will continue expanding at a solid pace ([1]).

27 700

EUR of real GDP were on average created by each EU inhabitant in 2017

Another indicator of economic growth is investment, as it represents spending that enhances an economy's productive capacity. This has an impact on living standards in the medium and long terms. The acquisition of capital goods can encompass, among other things,

In 2015 the European Commission launched an Investment Plan for Europe ([2]) to unlock more than EUR 315 billion of investment over three years. In 2017, the initial timeline was extended to 2020 and the investment target increased to at least EUR 500 billion ([3]).

The EU Capital Markets Union ([4]) aims to tackle investment shortages head-on by increasing and diversifying business funding and investment financing.

The EU launched an External Investment Plan ([5]) in 2016 to encourage investment in partner countries in Africa and the EU neighbourhood region, to strengthen partnerships and contribute to the achievement of the Sustainable Development Goals, with the aim of addressing some root causes of migration.

energy and transport infrastructure, industrial and service facilities, eco-innovative technologies, education and research and development (R&D). Long-term investment that is economically, environmentally and socially sound is crucial for supporting sustainable growth.

The total investment share of GDP in the EU was 20.6 % in 2017. It was influenced by the economic crisis, which interrupted the steady growth observed between 2004 and 2007. After periods of decline and stagnation, the indicator has grown moderately by 1.3 % on average per year since 2013. This growth is mainly attributable to an increase in business investment.

20.6 %
of GDP was invested in the EU in 2017

Economic growth in the EU has become more sustainable

Economic growth should not lead to increased environmental pressures and to major depletion of natural capital. Using natural resources more efficiently reduces the pressure from production and consumption and increases the competitiveness of the economy. Resource productivity, measured as GDP divided by domestic material consumption (DMC), monitors the relationship between what an economy produces and the physical materials it uses ([6]). Hence, it depicts an aggregate measure of an economy's material efficiency. The EU has increased its resource productivity by 36.4 % since 2001, reaching 2.04 EUR/kg in 2017. This favourable development can be attributed to GDP growth accompanied by a 9.0 % decrease in DMC, which reflects such factors as the long-term shift of the EU towards a service economy, globalisation and increasing reliance on imports ([7]).

2.04
EUR of GDP were produced in the EU for each kilogram of DMC used in 2017

Sustainable economic growth is also driven by trends in the green economy sectors represented by the environmental goods and services sector ([8]). Such goods and services include those produced for environmental protection and resource management. Environmental protection includes all activities that have the main aim of preventing, reducing and eliminating pollution and any other environmental degradation. The output from the EU's environmental goods and services sector has increased by 137.5 % since 2000, reaching EUR 735 727 million in 2015 ([9]). Over the same period, employment in the environmental goods and services sector increased by 47.3 % ([10]). These positive trends are especially remarkable as they have persisted during the economic crises and recovery, showing the sector is highly resilient.

Employment

Decent employment for all, including women, people with disabilities, youth, the elderly and migrants, is a cornerstone of socio-economic development and is crucial for improving the well-being of society as a whole. Apart from generating the resources needed to provide decent living standards and to achieve life goals, work grants opportunities for meaningful engagement in society, promoting a sense of self-worth, purpose and social inclusion. Increased employment is a key condition for making societies more inclusive by reducing poverty and inequality in and between both regions and social groups. Overall, while the employment situation of EU citizens has improved over the past few years, many more women than men remain inactive due to caring responsibilities for children or incapacitated adults.

Overall, the employment situation in the EU is improving

The economic recovery in the EU in the past few years has been reflected in improved employment prospects. Overall, the EU employment rate has exhibited a growing trend (with some interruptions in the aftermath of the economic crisis): it has grown by 5.4 percentage points compared to 2002 and by 3.8 percentage points compared to 2012, reaching 72.2 %

in 2017. However, it is still 2.8 percentage points behind the Europe 2020 employment target of 75 %, which might still be met if employment keeps rising at the pace recorded from 2013 onwards. The overall growth of the employment rate over the past decade can be partly attributed to older workers delaying their retirement and women increasing their participation in the labour force ([1]).

72.2 %
of 20 to 64 year olds were employed in the EU in 2017

The EU supports growth, job creation and competitiveness through funding instruments such as the European Fund for Strategic Investments, the European Pillar of Social rights, the European Structural and Investment Funds, Horizon 2020, the Employment and Social Innovation Programme (EaSI) ([12]), the Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME), the Emergency Support Instrument, the Connecting Europe Facility, the Creative Europe Programme, a Youth Guarantee ([13]) and the Youth Employment Initiative.

While labour market prospects for young people have improved as the economy has strengthened, this group continues to face a high risk of unemployment and social exclusion

People in their early 20s and those in the latter stages of their careers remained underrepresented in the job market: only 52.1 % of people aged 20 to 24 and only 57.1 % of 55 to 64 year olds were employed in 2017 ([14]). However, due to diverging socio-economic and demographic characteristics, employment trends for these two groups have developed quite differently over the past decade. Young people were the hardest hit by the economic crisis, with the employment rate for people aged 20 to 24 in 2017 still 2.8 percentage points below their 2008 level of 54.9 %, despite steady growth since 2014.

This age group also remained at a higher risk of unemployment. While the unemployment rate of 20 to 24 year olds has steadily decreased since 2013, reaching 15.5 % in 2017, it still remained significantly higher than for older age groups ([15]). It should be noted though that many in their early 20s are studying full-time and are therefore neither working nor looking for a job. As a result, in absolute terms this age group of unemployed people was not large and amounted to 2.7 million people in 2017 ([16]). Moreover, during the past few years this age group has experienced marked improvements in their labour market prospects: the youth unemployment ratio, which reflects the share of unemployed in the whole population of the same age group, has experienced a decline of 4.1 percentage points since 2013 and reached 9.6 % in 2017 ([17]).

Young people aged 15 to 24 are more likely than other age groups to be in involuntary temporary employment (13.9 % of total employees in 2017) or to have an involuntary part-time contract (8.0 % of total employment in 2017), and the share of young people in a part-time and temporary employment for whom it was not a personal choice has increased since 2008 ([18]).

Young people not engaged in employment nor in education and training (NEET) are among the most vulnerable groups in the labour market. Over the long term they could fail to gain new skills and suffer from erosion of competences, which in turn might lead to a higher risk of labour market and social exclusion. The NEET rate for 15 to 29 year olds in the EU between 2002 and 2017 closely followed the economic cycle, improving from 15.6 % to 13.4 % over these years. In 2017, more than half of NEETs (7.9 % of people aged 15 to 29) were not looking for a job and therefore were inactive, maintaining a

13.4 %
of young people aged 15 to 29 were not employed nor in education and training in the EU in 2017

similar rate since 2006 ([19]). Fluctuations in the total NEET rate have thus been triggered by variations in unemployment. The reduction in the NEET rate over the past four years was mainly due to unemployed NEETs moving into work ([20]).

Only a small fraction of young people do not want to work — in 2017, only 4.7 % of 15 to 29 year olds were neither in education nor in training and did not want to work. This indicates that nearly a third of NEETs would have liked to work but were not actively seeking employment or gave up looking for a job.

The European Social Fund ([21]) and the Youth Employment Initiative support measures that focus on quality employment and quality apprenticeships. The EU has also contributed to the elaboration of a Youth Guarantee ([22]) to support the employment and education of young people.

In contrast to young people, the situation of people aged 55 to 64 seems to have been less affected by the economic slowdown: their employment rate has increased by 11.6 percentage points since 2008 and reached 57.1 % in 2017. Apart from structural factors, this trend can be linked to recent pension reforms that led to longer working lives by increasing the pensionable age, the age for early retirement and length of contribution ([23]). For people in the latter stages of their career path, unemployment was the lowest among all age groups, at 5.8 % for the age group 55 to 64 ([24]). This may be connected to the fact that if people of this age lose their job they tend to become economically inactive or retire and therefore no longer count as being unemployed.

A higher education leads to increased employment possibilities

In a knowledge-based economy, such as the EU is today, educational attainment is crucial for securing a job and adequate income. Indeed, in 2017 a person aged 20 to 64 living in Europe with a tertiary education was much more successful in landing a job (employment rate of 84.0 %) compared to those with upper secondary or post-secondary non-tertiary education (employment rate of 72.6 %) and with lower secondary or lower education (employment rate of 54.9 %) ([25]). The unemployment rate among people with tertiary education in 2017 in the EU was 4.6 %, in comparison to 6.7 % for those with upper secondary or post-secondary non-tertiary education and 7.5 % of the total unemployment rate for the age group of 20 to 64 year olds ([26]).

Nowadays, upper secondary education is considered the minimum level Europeans should attain before leaving the education and training system. Therefore, low educational attainment is one of the key determinants of young people entering the NEET category. In 2017, the NEET rate for people with tertiary education was only 1.9 %, compared to 5.4 % for people with less than primary, primary and lower secondary education and 6.0 % for people with upper secondary or post-secondary non-tertiary education ([27]).

Employment opportunities are lower for migrants and people with disabilities

In 2014, the employment rate of people with disabilities at the European level was 23.8 percentage points lower compared to people without disabilities. Only 48.7 % of people with disabilities were employed in that year, compared to 72.5 % of those without disabilities. For women with disabilities the rate was 45.7 %, while for men with disabilities it was 52.3 %. The degree of disability is also an important factor affecting the employment rate. At the EU level, the employment rate for people with a severe disability was 28.3 %, while for people with a moderate disability it stood at 56.7 % in 2014 ([28]).

The Active Inclusion Approach ([29]) is a Commissions' recommendation to enable every citizen, notably the most disadvantaged, to fully participate in society, including having a job.

Country of citizenship also affects the labour market prospects of individuals in the EU. Migrant workers from countries outside the EU not only tend to occupy low-skilled and insecure jobs with temporary contracts and poorer working conditions, they also show lower employment rates than EU citizens ([30]). In 2017 their employment rate was 57.4 %, 14.8 percentage points lower than the total employment rate. Migrants were particularly affected by the economic crisis, being among the first to lose their jobs: during the post-crisis recovery the gap between the total EU employment rate and those of non-EU citizens widened from 7.7 percentage points in 2008 to 14.7 percentage points in 2017 ([31]).

The risk of being unemployed in 2017 was also highest for migrants from outside the EU, at 16.3 % compared to the total unemployment rate of 7.5 % ([32]). Young migrants from outside the EU (age group 15 to 29) are at the highest risk of being neither in employment nor in education and training compared to the total EU population: the NEET rate for this group of the population in 2017 was 25.6 %, which is almost twice as high as the total NEET rate in the EU ([33]). The risk of falling into the NEET category for young migrants from outside the EU rises with age: in 2017, the NEET rate for 15 to 17 year olds was only 4.9 %, in comparison to 26.1 % for 25 to 29 year olds.

Women's participation in the labour market is increasing but gender differences persist

Over the past 15 years, the employment rate of women in the EU has been increasing and reached a new record high of 66.5 % in 2017. This development was mainly driven by a strong increase in the employment rate of women in their late career paths, aged 55 to 64. However, despite a decline of 5.8 percentage points since 2002, the gender employment gap persists. In 2017 it amounted to 11.5 percentage points, with employment rates of 78.0 % for men and 66.5 % for women. This is despite the fact that women are increasingly well qualified and are even out-performing men in terms of educational attainment. In 2017, 44.9 % of women aged 30 to 34 had attained tertiary education, compared to only 34.9 % of men (see the chapter on SDG 4 'Quality education' on page 94).

Young women aged 15 to 29 are also at higher risk than men of being neither in employment nor in education and training. The NEET rate for women in 2017 was 15.4 %, compared to 11.5 % for men.

31.0 %
of economically inactive women in the EU were in this situation because of caring responsibilities in 2017

The lower employment rates for women might be related to the fact that women of working age are more likely than men to be economically inactive. In 2017, 31.0 % of inactive women aged 20 to 64 were in this situation due to caring responsibilities for children or incapacitated adults, compared to only 4.5 % of men. This gender gap has increased since 2005.

Long-term unemployment has decreased since 2013

Long-term unemployment can have long-lasting negative implications for individuals and society by endangering social cohesion and increasing the risks of poverty and social exclusion. Beyond material living standards, it can also lead to deterioration of individual skills and health, thus hindering future employability, productivity and earnings. At a societal level, prolonged unemployment can have negative fiscal implications because of higher social transfers. In 2017, 8.3 million people or 3.4 % of the active population in the EU had been unemployed for a year or more, 1.7 percentage points less than at the peak of long-term unemployment in 2013.

3.4 %
of the active population had been long-term unemployed in 2017

Long-term unemployment usually follows strong growth in unemployment but with a delay. This means it can be considered to be the main legacy of the crisis, with the proportion of long-term

unemployed people among all unemployed rising from 38.9 % in 2008 to 46.5 % in 2017 ([34]). Strong declines in long-term unemployment only started being observed in 2014, after the economic recovery kicked off in 2013 ([35]).

Decent work

For a society's sustainable economic development and well-being it is crucial that economic growth generates not just any kind of job but 'decent' ones. This means that work should deliver fair income, security in the workplace and social protection, and allow flexibility.

Over the past few years, work in the EU has become safer but less economically secure

A prerequisite for decent work is a safe and healthy working environment, such as without fatal accidents. Over the past few years Member States have put considerable effort into ensuring minimum labour standards. In 2016, the rate of fatal accidents at work amounted to 1.52 fatal accidents per 100 000 employed persons. The rate has fallen considerably since 2008, indicating progress towards safer working places.

1.52
per 100 000 people employed in the EU had a fatal accident at work in 2016

Agriculture, forestry and fishing, manufacturing, construction, transportation and storage appear to be the most dangerous activities in the EU. In 2016, the number of fatal accidents in these activities combined represented 67.5 % of all fatal accidents. These economic activities are mostly male-dominated, and in 2016 the incidence rate of fatal accidents for men was more than 30 times higher than for women ([36]). The risk of fatal accidents also rises with age, with the risk for workers aged 55 and above more than twice as high as for younger workers ([37]).

The rate of non-fatal accidents at work has also decreased since 2008 ([38]). In 2016, there were 1 403 incidents per 100 000 people employed in the EU compared to 1 940 in 2008. As a result of these accidents, 46.7 % of injured workers were out of work for up to one month and 3.7 % became permanently incapable of work or were out of work for more than half a year ([39]). In 2016, 19.1 % of all non-fatal injuries happened in manufacturing activities.

Besides safety at work, fair income and social protection are further important components of decent work. Poverty is often associated with the absence of a paid occupation. However, low wages can also push some workers below the poverty line. Since 2005, the share of the so-called 'working poor' (aged 18 and over) in the EU has increased by 1.4 percentage points, affecting 9.6 % of employed people in 2016 ([40]).

9.6 %
of people employed in the EU were at risk of income poverty in 2016

Factors influencing in-work poverty rates include, among other things, type of contract, working time and hourly wages. While a fixed-term or part-time contract may provide greater flexibility for both employers and workers, it is not always a personal choice for an employee and can thus significantly influence their well-being. In 2017, 7.7 % of European employees were involuntarily working on temporary contracts, corresponding to 57.7 % of all temporary employees. This share has increased slightly over the past decade ([41]). Similar to involuntary temporary employment, the share of involuntary part-time employment in total employment in the EU also increased, from 4.4 % in 2008 to 5.1 % in 2017 ([42]).

Presentation of the main indicators

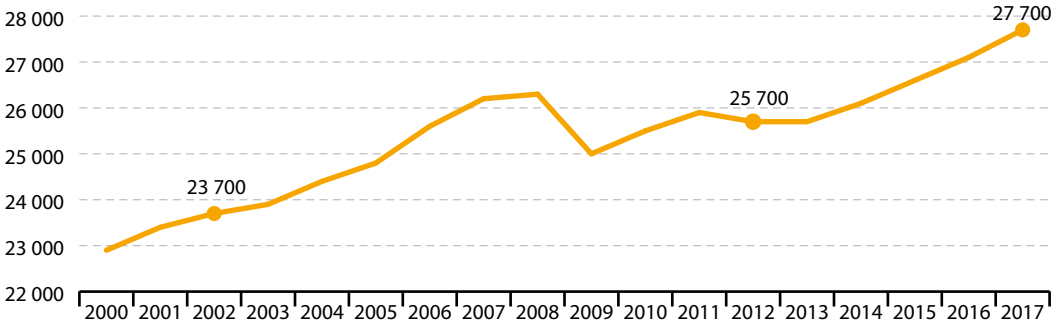
Real GDP per capita

LONG TERM 2002–2017

SHORT TERM 2012–2017

Gross domestic product (GDP) is a measure of economic activity and is commonly used as a proxy for developments in a country's material living standards. It refers to the value of total final output of goods and services produced by an economy within a certain period of time. Real GDP per capita is calculated as the ratio of real GDP (GDP adjusted for inflation) to the average population of a specific year and is based on rounded figures.

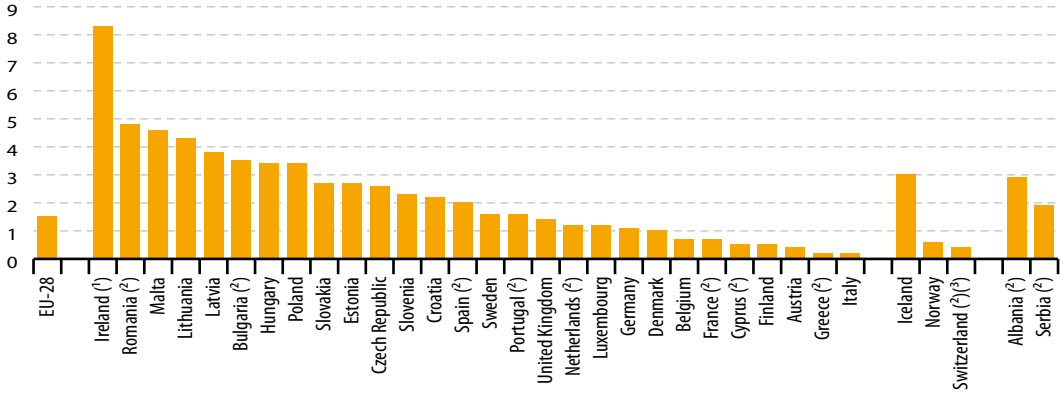
Figure 8.1: Real GDP per capita, EU-28, 2000–2017
(EUR per capita, chain-linked volumes (2010))



Source: Eurostat (online data code: sdg_08_10)

Figure 8.1 shows that based on GDP per capita Europeans have continued to enjoy rising living standards over the past two decades. Between 2002 and 2017, real GDP per capita grew by an average of 1.0 % per year. In the short-term period from 2012 to 2017, growth was even faster, at 1.5 % on average per year.

Figure 8.2: Change in real GDP per capita, by country, 2012–2017
(average annual growth rate in %)



(1) Break in time series in 2017.
(2) Provisional or estimated data.
(3) 2011–2016.

Source: Eurostat (online data code: sdg_08_10)

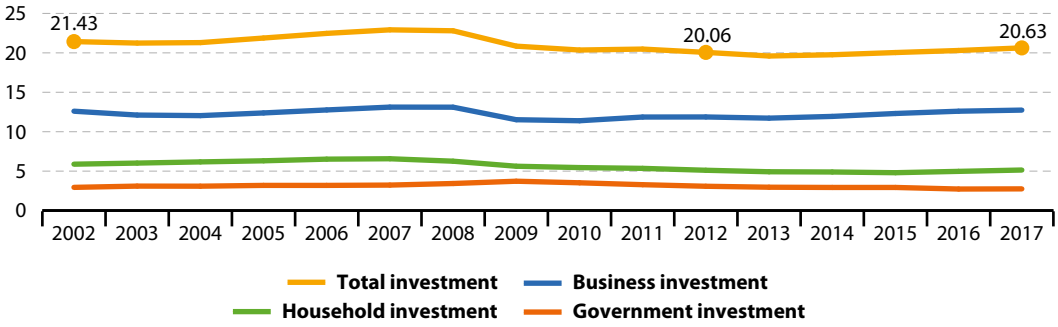
LONG TERM 2002–2017

SHORT TERM 2012–2017

Investment share of GDP

Investment share of GDP measures the investment for the total economy, government, business as well as household sectors. The indicator is calculated as the share of GDP used for gross investment. It is defined as gross fixed capital formation (GFCF) expressed as a percentage of GDP for the government, business and households sectors.

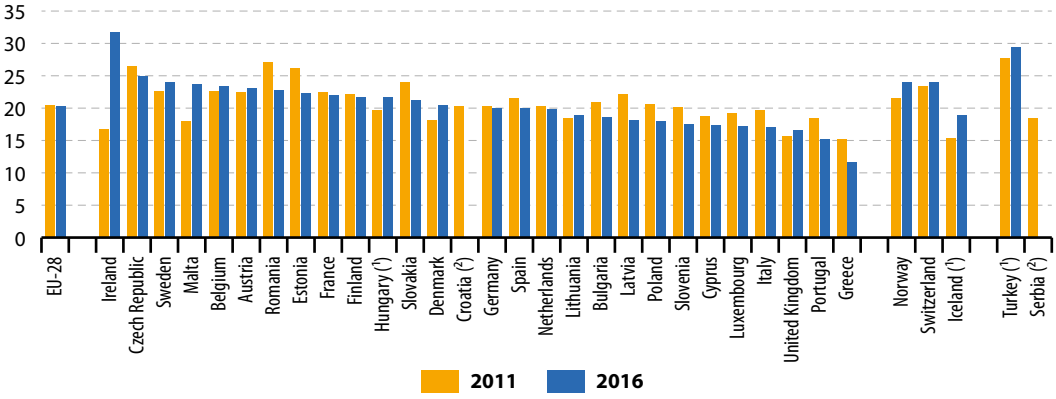
Figure 8.3: Investment share of GDP by institutional sector, EU-28, 2002–2017
(% of GDP)



Source: Eurostat (online data code: sdg_08_11)

Total investment share of GDP in the EU has slightly decreased over time. Between 2002 and 2017 total investment fell by an average of 0.3 % per year. However, in the short term between 2012 and 2017 total investment experienced moderate growth of 0.6 % on average per year.

Figure 8.4: Investment share of GDP, by country, 2011 and 2016
(% of GDP)



(1) 2015 data (instead of 2016).
(2) No data for 2016.

Source: Eurostat (online data code: sdg_08_11)

Young people neither in employment nor in education and training

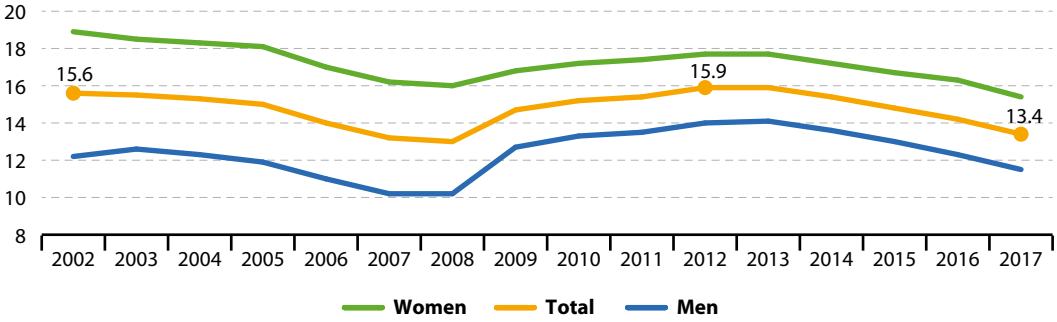
LONG TERM 2002–2017

SHORT TERM 2012–2017

A considerable proportion of young people aged 15 to 29 in the EU are economically inactive. For some this is because they are pursuing education and training. Others, however, have withdrawn from the labour market or are not entering it after leaving the education system. Those who struggle with the transition from education to work are captured by the statistics on young people who are neither in employment, education nor training (NEET rate). Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

Figure 8.5: Young people neither in employment nor in education and training, by sex, EU-28, 2002–2017

(% of population aged 15 to 29)



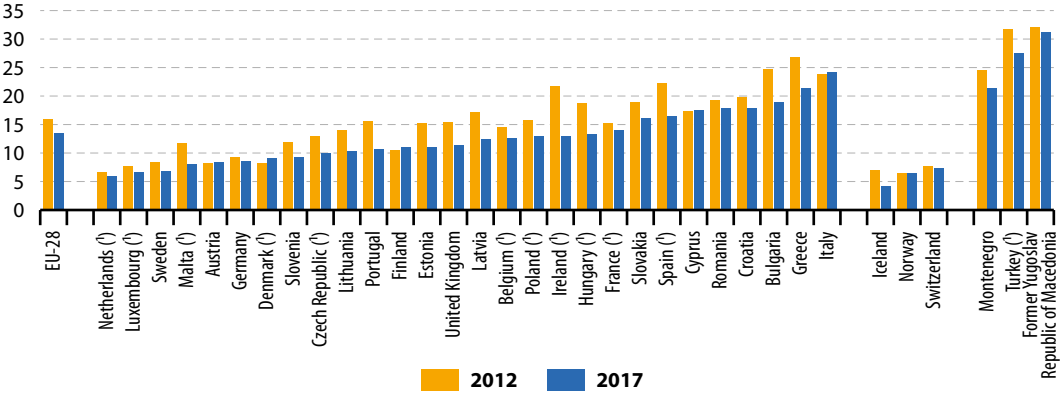
Note: Breaks in time series in 2003 and 2006.

Source: Eurostat (online data code: sdg_08_20)

The development of the EU's total NEET rate was heavily influenced by the economic crisis, as suggested by Figure 8.5. Between 2002 and 2017, the share of young people aged 15 to 29 who were not employed and not receiving further education or training decreased on average by 1.0 % per year. The short-term decline between 2012 and 2017 was much quicker, averaging 3.4 % per year.

Figure 8.6: Young people neither in employment nor in education and training, by country, 2012 and 2017

(% of population aged 15 to 29)



(1) Break(s) in time series between 2012 and 2017.

Source: Eurostat (online data code: sdg_08_20)

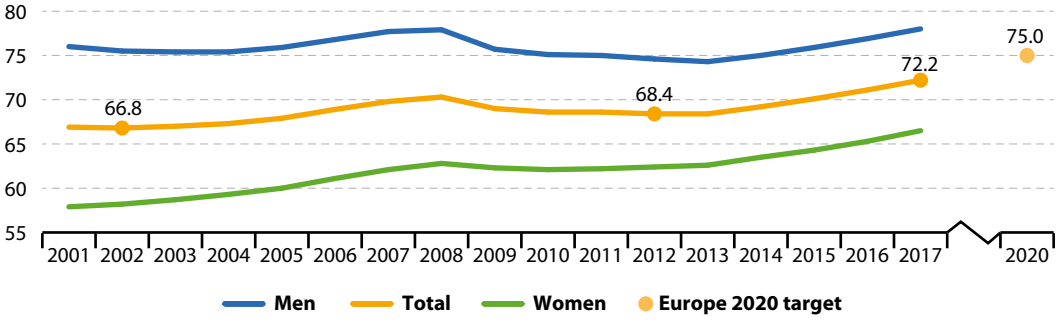
LONG TERM 2002–2017

SHORT TERM 2012–2017

Employment rate

The employment rate is defined as the percentage of employed persons in relation to the comparable total population. The data analysed here focus on the population aged 20 to 64 with the view of monitoring the Europe 2020 strategy target of raising employment rates among this age group to 75 % by 2020 ([43]). Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

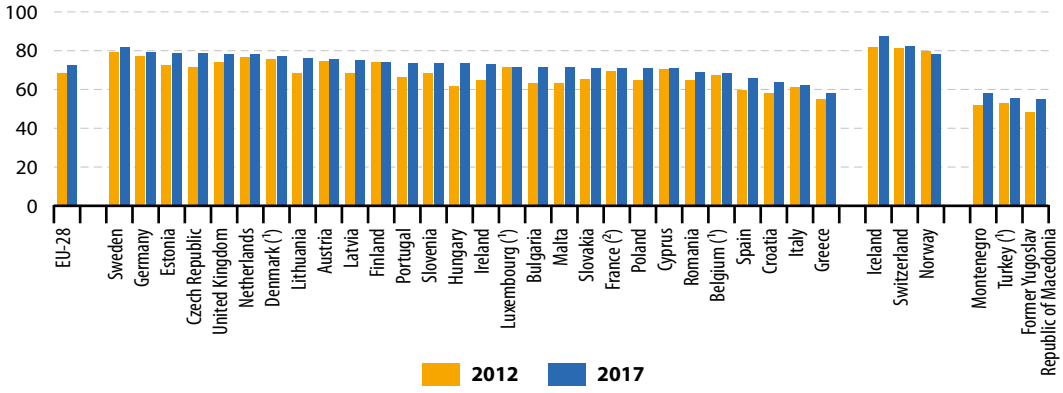
Figure 8.7: Employment rate, by sex, EU-28, 2001–2017
(% of population aged 20 to 64)



Source: Eurostat (online data code: sdg_08_30)

The EU employment rate grew on average by 0.5 % a year between 2002 and 2017. As shown in Figure 8.7, this rather slow growth resulted from a period of decline following the onset of the economic crisis in 2008. During the short-term period between 2012 and 2017, growth accelerated to 1.1 % on average per year. While the increases observed over both the long- and short-term periods may not appear fast enough to reach the Europe 2020 employment target of 75 % by 2020, the goal can still be met if the growth recorded from 2013 onwards (1.4 % per year) is sustained.

Figure 8.8: Employment rate, by country, 2012 and 2017
(% of population aged 20 to 64)



(1) Break(s) in time series between 2012 and 2017.
(2) Data refer to metropolitan France.

Source: Eurostat (online data code: sdg_08_30)

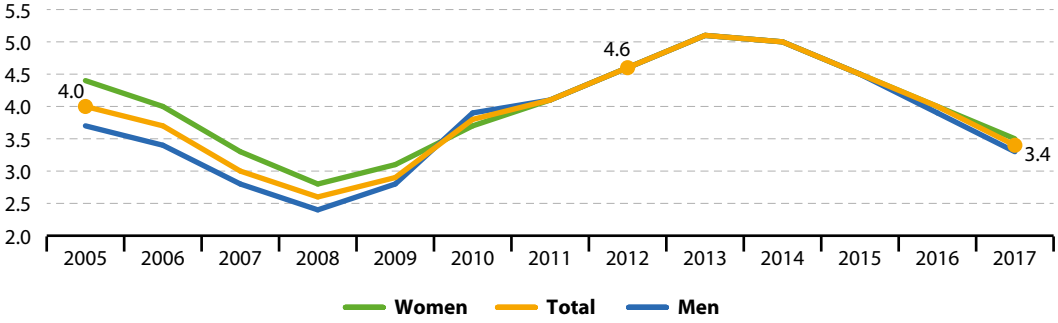
Long-term unemployment rate

LONG TERM 2005–2017

SHORT TERM 2012–2017

Long-term unemployment is measured for economically active people (which includes both employed and unemployed people) aged 15 to 74 who have been unemployed for 12 months or more. Long-term unemployment increases the risk of falling into poverty and has negative implications for society as a whole. Long-term unemployed people in the EU have about half the chance of finding employment as those who where short-term unemployed ([44]). Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

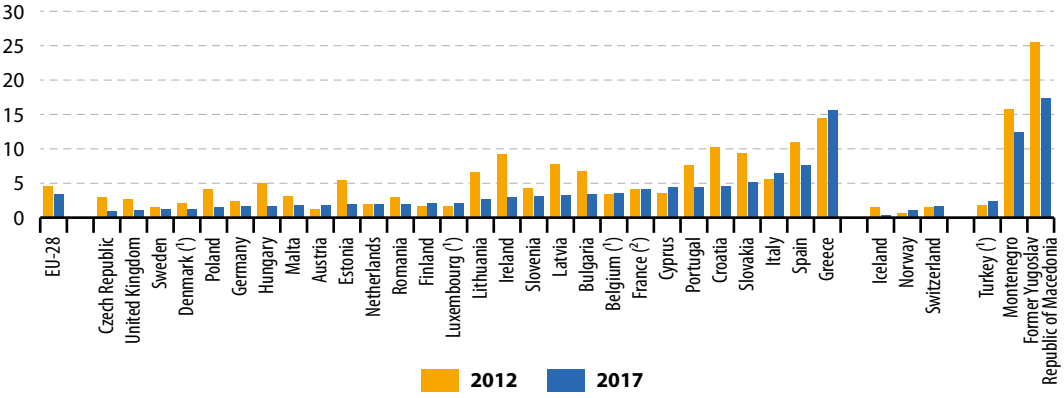
Figure 8.9: Long-term unemployment rate, by sex, EU-28, 2005–2017
(% of active population)



Source: Eurostat (online data code: sdg_08_40)

In 2017, 8.3 million people or 3.4 % of the active population in the EU were long-term unemployed. The EU's long-term unemployment rate was strongly affected by the economic crisis and declined on average by 1.3 % per year between 2005 and 2017. In the short term, the rate fell by 5.9 % per year on average.

Figure 8.10: Long-term unemployment rate, by country, 2012 and 2017
(% of active population)



(1) Break(s) in time series between 2012 and 2017.
(2) 2012 data are estimates.

Source: Eurostat (online data code: sdg_08_40)

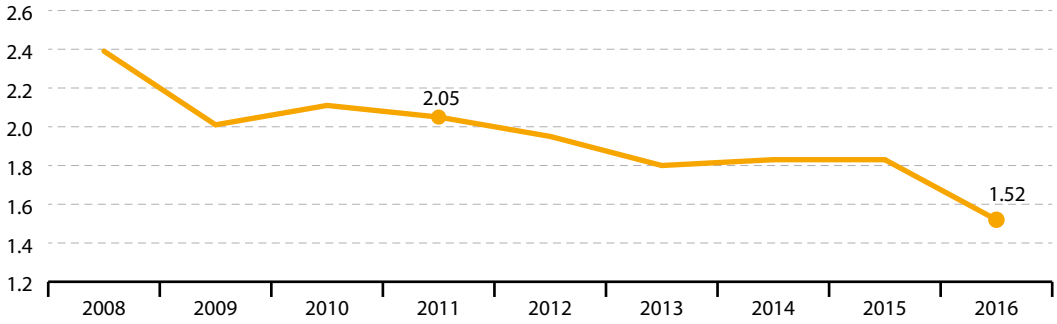
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2011–2016

People killed in accidents at work

Fatal accidents at work are those occurring during the course of employment and lead to the death of the victim within one year. The incidence rate refers to the number of accidents per 100 000 persons in employment. Data presented in this section are collected in the framework of the administrative data collection 'European Statistics on Accidents at Work (ESAW)' ([45]). As an exception, accident data for the Netherlands are based on survey data.

Figure 8.11: People killed in accidents at work, EU-28, 2008–2016
(number per 100 000 employees)

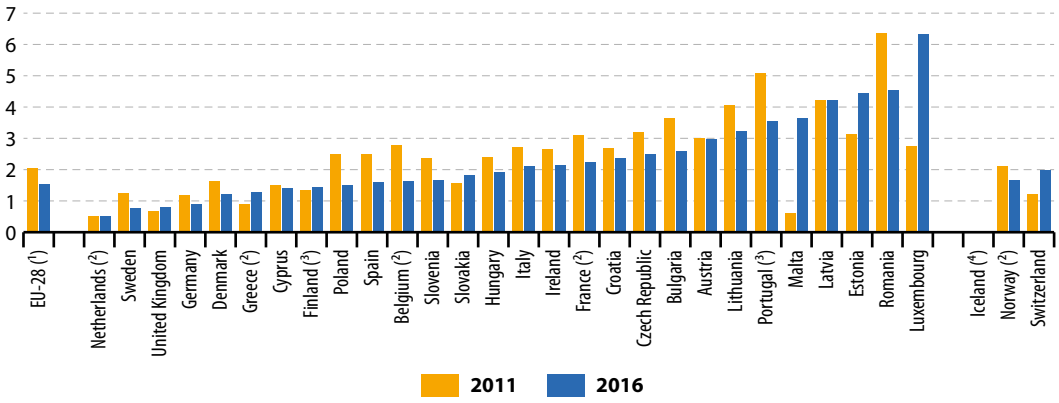


Note: 2013 and 2016 data are provisional.

Source: Eurostat (online data code: sdg_08_60)

In the EU, the incidence rate of fatal accidents at work fell by an average rate of 5.8 % per year between 2011 and 2016. While the time series is not long enough to allow a long-term (at least 10-year) trend to be calculated, available data indicate an almost continuous decline in fatal work accidents in the EU since 2008.

Figure 8.12: People killed in accidents at work, by country, 2011 and 2016
(number per 100 000 employees)



(1) 2016 data are provisional.
(2) Break in time series in 2014
(3) 2015 data (instead of 2016).
(4) 2013 data (instead of 2016).

Source: Eurostat (online data code: sdg_08_60)

Further reading on decent work and economic growth

European Commission (2017), *Employment and Social Developments in Europe 2017*, Luxembourg, Publications office of the European Union.

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Eurostat, Europe 2020 headline indicators.

Eurostat, Production, value added and exports in the environmental goods and services sector.

Eurostat, Employment in the environmental goods and services sector.

Eurostat, Gender employment gap.

Eurostat, People living in households with very low work intensity by sex.

Eurostat, Employment in current job by duration.

Eurostat, Compensation of employees per hour worked.

Notes

(1) European Commission (2018), *European Economic Forecast Winter 2018 (Interim)*, Institutional Paper 073, p. 1.
(2) European Commission (2014), *An Investment Plan for Europe*, COM/2014/0903 final.
(3) European Commission (2017), *European Commission — Press release: Commission welcomes agreement in principle to extend and reinforce Investment Plan's European Fund for Strategic Investments (EFSI)*.
(4) European Commission (2015), *European Commission — Press release: Capital Markets Union: an Action Plan to boost business funding and investment financing*.
(5) European Commission (2017), *EU External Investment Plan — Factsheet*.
(6) Resource productivity is defined as GDP per unit of domestic material consumption (DMC), measured in EUR per kilogram. Part of these materials are directly consumed by households, which means that they are not used as an input to production activities. Thus, resource productivity is not directly comparable to concepts such as labour or capital productivity.
(7) European Environment Agency (2016), *More from less — material resource efficiency in Europe. 2015 overview of policies, instruments, and targets in 32 countries*, EEA report No. 10/2016, Copenhagen: EEA, p.38.
(8) Eurostat (2017), *Statistics Explained: Environmental goods and services sector*.
(9) Source: Eurostat (online data code: env_ac_egss2).
(10) Source: Eurostat (online data code: env_ac_egss1).
(11) European Commission (2017), *Employment and Social Developments in Europe 2017*, p. 10.
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(14) Source: Eurostat (online data code: lfsa_ergan).
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(22) European Commission (2013), *Recommendation on establishing a Youth Guarantee*, 2013/C 120/01.
(23) European Commission (2016), *Employment and Social Developments in Europe 2015*, p. 300.
(24) Source: Eurostat (online data code: lfsa_urgaed).
(25) Source: Eurostat (online data code: lfsa_ergaed).
(26) Source: Eurostat (online data code: lfsa_urgaed).
(27) Source: Eurostat (online data code: yth_empl_160).
(28) Academic Network of European Disability experts (2017), *European comparative data on Europe 2020 & People with disabilities*, pp. 61–72.
(29) European Commission (2008), *Recommendation on the active inclusion of people excluded from the labour market, notified under document number C(2008) 5737*, 2008/867/EC.
(30) European Commission (2016), *Employment and Social Developments in Europe 2015*, p. 177.
(31) Source: Eurostat (online data code: lfsa_ergan).
(32) Source: Eurostat (online data code: lfsa_urgan).
(33) Source: Eurostat (online data code: edat_lfse_23).
(34) Source: Eurostat (online data code: une_ltu_a).
(35) European Commission (2017), *Employment and Social Developments in Europe 2017*, p. 29.
(36) Source: Eurostat (online data code: hsw_ph3_01).
(37) Ibid.
(38) Source: Eurostat (online data code: hsw_n2_01).
(39) Source: Eurostat (online data code: hsw_n2_04).
(40) Source: Eurostat (online data code: ilc_iw01).
(41) Source: Eurostat (online data code: lfsa_etgar).
(42) Source: Eurostat (online data codes: lfsa_epgar, lfsa_epgaed).
(43) In a majority of Member States 15 to 19 year olds are still in education or training and few are seeking employment (even part-time). Therefore, the lower age limit of the Europe 2020 strategy's employment target has been set at 20 years. The upper age limit for the employment rate is usually set to 64 years, taking into account statutory retirement ages across Europe.
(44) European Commission (2016), *Employment and Social Developments in Europe 2015*, p. 13.
(45) European Statistics on accidents at Work, ESAW.

9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

Goal 9 calls for building resilient and sustainable infrastructure and promotes inclusive and sustainable industrialisation. It also recognises the importance of research and innovation for finding lasting solutions to social, economic and environmental challenges.

eurostat supports the SDGs

To combat a wide range of political, economic and sustainability challenges that the EU is facing, SDG 9 calls on countries to build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation. Inclusive and sustainable industrial development is the primary source of income and allows for rapid and sustained increases in living standards for all people. Research and development (R&D) and innovation drive economic growth, job creation, labour productivity and resource efficiency. They are crucial for a knowledge-based economy and to ensuring EU companies remain competitive. Similarly, investments in sustainable and energy-efficient transport and mobility systems are key elements for achieving sustainable development.

Table 9.1: Indicators measuring progress towards SDG 9, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
R&D and innovation			
Gross domestic expenditure on R&D	↘	↘	page 174
Employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors	:	↗	page 175
R&D personnel	↑ (1)	↑	page 176
Patent applications to the European Patent Office (EPO)	↗	↘	page 177
Sustainable transport			
Share of buses and trains in total passenger transport	↘	↗	page 178
Share of rail and inland waterways activity in total freight transport	↘ (2)	↓	page 179
Average CO_2 emissions per km from new passenger cars (*)	↗ (3)	↗	SDG 12, page 229

(*) Multi-purpose indicator.
(1) Past 14-year period.
(2) Past 11-year period.
(3) Past 10-year period.

Table 9.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Industry, innovation and infrastructure in the EU: overview and key trends

Monitoring SDG 9 in an EU context focuses on two main dimensions: R&D and innovation, and sustainable transport. As Table 9.1 shows, the EU has progressed in R&D and innovation along several lines over the past few years, while some areas remained stagnant. Similarly, a mixed picture can be observed concerning sustainable transport: while the share of buses and trains in passenger transport has increased and CO_2 emissions from cars declined, the share of rail and inland waterways in freight transport has not changed substantially.

R&D and innovation

Being a key enabling factor for smart, sustainable and inclusive growth, R&D expenditure is a vital contributor to human capital development as it creates knowledge and improves skills. Highly skilled human resources in turn are imperative for keeping the EU's research and innovation capacity and competitiveness up to date. Innovative products and services, as a result of R&D activities, not only contribute to smart growth but also to inclusiveness and sustainability objectives. Introducing new ideas to the market promotes job creation, labour productivity and efficient use of resources. R&D and innovation are also essential for finding solutions to societal challenges such as climate change and clean energy, security, and active and healthy ageing.

The selected indicators look at the monetary input into R&D and innovation activities, the human resources employed in this sector, and the innovation output in terms of filed patents. The picture derived from available data for these indicators for the EU since 2008 is characterised by more or less stagnant trends of the inputs and outputs (R&D intensity and patents), accompanied by a continuous increase in the human resources engaged in R&D and innovation activities.

More investment in R&D needed to meet the Europe 2020 target

The EU economy is facing increasing global competition and can only remain competitive with other countries by strengthening its scientific and technological base. Therefore, one of the key aims of EU policies over recent decades has been to encourage increasing investment in R&D. However, EU expenditure on R&D in relation to GDP (R&D intensity) has shown a modest growth during the past 15 years. After a prolonged stagnation between 2001 and 2007, R&D intensity has increased slowly and has stabilised at slightly above 2.0 % since 2012, reaching 2.03 % in 2016. With a gap of about one percentage point, the EU thus remains far from its 3 % target for 2020.

2.03 %
of GDP was spent on R&D in the EU in 2016

Overall, in many Member States the R&D intensity emerged stronger from the economic crisis following stagnation in GDP and increased public funding for R&D. Nevertheless, only Sweden and Austria recorded R&D intensities above 3 % of GDP in 2016.

The Europe 2020 strategy sets the target of 'improving the conditions for innovation, research and development' ([1]), in particular with the aim of 'increasing combined public and private investment in R&D to 3 % of GDP' by 2020.

Private expenditure accounts for almost two-thirds of total R&D expenditure

An analysis of R&D expenditure by sector of performance shows that the two biggest spenders in 2016 remained the business enterprise sector (65.0 %) and the higher education sector (23.2 % of total R&D expenditure in 2016). Despite its more modest share of 11.3 % in 2016, the government sector plays an important role, especially in the long-term stability of R&D expenditure and in fostering public-private initiatives. The size of the private non-profit sector is almost negligible, accounting for less than 1.0 % of the total R&D expenditure in 2016.

The business enterprise sector did not only account for the lion's share of total R&D expenditure, it also increased its R&D intensity from 1.15 % of GDP in 2001 to 1.32 % in 2016, showing growth of 0.17 percentage points over 15 years. The largest contribution to this growth came from the automotive industry, ICT producers and health industries, while the aerospace and defence as well as the chemicals sectors reduced their contributions. R&D growth in non-EU companies was also led by ICT and health industries, but with reduced contributions by the chemicals and automotive sectors ([2]). In contrast to the business enterprise sector, the R&D intensities of the three other sectors — higher education, government and non-profit — have more or less stagnated at relatively low levels. Expenditure in the higher education sector increased from 0.38 % of GDP in 2001 to 0.47 % in 2016. The R&D intensities of the government sector (0.23 %) and the private non-profit sector (0.02 %) were virtually identical to the ratios recorded some 15 years earlier.

R&D expenditure in EU business enterprises boosts knowledge creation, turning ideas in to new products and services, for which new patents are registered. Patents provide a valuable measure of the exploitation of research results and of the inventiveness of countries, regions and companies. While EU patent applications increased considerably in the years before the economic crisis (up to 2007), they have more or less stagnated since then despite the slight but continuous increase in business' R&D intensity. In 2017, less than 55 000 patent applications were submitted to the European Patent Office, which is almost 4 000 applications fewer than ten years earlier.

54 649

patent applications from within the EU were submitted to the European Patent Office in 2017

The business sector is the largest source of R&D investment across Member States

Differences between countries' R&D investment, particularly business R&D spending, reflect the industrial structure of economies, differences in the knowledge intensity of sectors and the research capabilities of countries ([3]). In general, a low business sector R&D intensity in a Member State indicates that the broader innovation system and framework conditions for this type of investment are insufficiently attractive ([4]). Business R&D can integrate and transform available knowledge into commercially viable technologies and innovation such as greener products, processes and services that enable higher labour productivity, industrial competitiveness, resource efficiency and reduced environmental impacts.

In a majority of EU Member States, R&D expenditure in the business sector was the main determinant of a country's total R&D intensity over the past decade. Furthermore, the business enterprise sector was the biggest employer of R&D personnel, providing jobs (full-time equivalent) for around half of this workforce in 2016. The business sector consequently is the largest R&D sector of performance in the most research-intensive Member States (those with the highest R&D intensities). Conversely, in the least research-intensive countries, such as the Baltic countries and some southern and eastern Member States, the public sector — higher education and government — tends to account for most of the R&D expenditure. There are, however, exceptions to this pattern in the east (Hungary and Slovenia) and in the south (Italy and Spain).

The EU strives to provide the necessary human capital for a knowledge-based society

Climate change mitigation and the transition to a green and low-carbon economy require significant innovation and create new scientific and technical occupations in key manufacturing and energy sectors. This structural change has important implications for employment as it helps to accommodate and stimulate the development of a highly skilled labour force. Between 2012 and 2017, the share of employed people working either in high- and medium-high technology manufacturing or in knowledge-intensive service sectors increased slightly from 44.9 % to 45.8 %. Furthermore, the EU aims to create an innovation-friendly environment for researchers and entrepreneurs that makes it easier for great ideas to be turned into products and services. Possibly due to these efforts, the share of R&D personnel in the economically active population — including researchers and other staff employed directly in R&D — has increased steadily since 2002 and reached 1.2 % in 2016. This trend was mainly driven by the business enterprise sector, where the share of R&D personnel (full-time equivalent) grew by 0.19 percentage points between 2002 and 2016.

45.8 %
of employed people in the EU worked in high- and medium-high technology manufacturing or in knowledge-intensive services in 2017

Women remain underrepresented in the R&D sector, but outperform men in knowledge-intensive jobs

In the EU, women accounted for more than a third of those employed in R&D in 2015 (35.1 %) ([5]). Despite growth in the number of women with a tertiary education in science over the past few years, they are still underrepresented in the science and technology fields in the EU ([6]). This might be explained by the fact that women still engage in different fields of study than men. For instance, men are more than two times more likely than women to choose a degree in engineering, manufacturing and construction, while women are twice as likely to pursue an education degree ([7]).

Gender differences are also evident when looking at people employed in high- and medium-high technology manufacturing and knowledge-intensive service sectors. Employment in knowledge-intensive services makes up the lion's share of total employment, amounting to 40.0 % in 2017. Notably, less than a third of all employed men (30.4 %) but more than half of all employed women (51.3 %) were working in this sector in 2017. The shares of this sector in total employment have slightly grown for both men and women over the past few years. In contrast, employment in high- and medium-high technology manufacturing sectors has stagnated at slightly below 6 % of total employment since 2008, amounting to 5.8 % in 2017. In this year, 7.9 % of all employed men but only 3.3 % of all employed women were working in these sectors.

1.2 %
of the active population in the EU worked in R&D in 2016

Sustainable transport

In addition to R&D and innovation, sustainable and energy-efficient transport and mobility systems are key elements for a competitive economy. As the transport sector is responsible for one quarter of energy-related greenhouse gas (GHG) emissions worldwide (see the chapter on SDG 13 'Climate action' on page 248), sustainable transport is an essential ingredient in sustainable development strategies. Rethinking future mobility includes optimising the use of all modes of transport, car sharing and integration between different modes of collective transport such as train, tram, metro, bus and taxi (multimodal transport). At the EU level, however, the long-term trends of the selected indicators do not point to a shift to more sustainable transport modes. The dominant modes for freight and passenger transport —

trucks and passenger cars, respectively — have gained further shares since 2000. The short-term trends paint a more favourable picture for passenger transport, including progress towards cleaner car fleets.

Signs of passenger transport becoming more sustainable over the past few years

Growth in transport activities puts increasing pressure on natural resources and on societies. Emissions of greenhouse gases, air pollutants and noise from transport affect the climate, environment and human health. The shares of different transport modes in total passenger transport (modal split) have not changed substantially since 2000, with passenger cars still accounting for almost 83 % of total land passenger transport in the EU ([8]). The share of buses and trains has slightly fallen over the same period, from 17.3 % in 2001 to 17.1 % in 2016. In the short term (since 2011), the share of these transport modes has increased moderately, by 0.3 percentage points.

17.1 %
of total inland passenger-km in the EU were covered by buses and trains in 2016

The largest increases in the share of cars in total passenger transport over the past five years were recorded in the youngest Member States, partly reflecting their economic growth and the increase in personal income. While cars remain the dominant mode for passenger transport across the EU, new car fleets are becoming cleaner: average carbon dioxide (CO_2) emissions from new passenger cars have fallen almost continuously since 2007, reaching 118.5 g CO_2 per km in 2017 ([9]). While the emission reduction target for new passenger cars for 2015 (130 g CO_2 per km) was met two years in advance, slightly stronger progress will be needed to also meet the stricter target of 95 g CO_2 per km set for 2021.

118.5
grams of CO_2 per km were emitted by new passenger cars in the EU in 2017

The decline in car fleets' CO_2 emissions can be attributed to newly implemented environmental regulation policies and technological progress. Member States have additionally managed to speed up the reduction of new cars' CO_2 emissions by demand-oriented incentives such as scrappage schemes, extra taxes on cars with high CO_2 emissions or purchase grants for low-emission vehicles such as hybrids (see the chapter on SDG 12 'Responsible consumption and production' on page 221).

EU legislation sets mandatory emission reduction targets for new cars ([10]). This legislation is the cornerstone of the EU's strategy to improve the fuel economy of cars sold on the European market.

The freight transport system in the EU still relies on road transport

Similar to the modal split of passenger transport, the modal split of freight transport has not changed substantially since 2005. Despite the EU policy objective of shifting freight from road to rail, road continues to have by far the largest share of EU freight transport performance among the three inland transport modes analysed in this report (road, rail and inland waterways). Due to a marked increase in the share of road freight transport from 2015 to 2016, the share of rail and inland waterways in 2016 was lower than in most preceding years, accounting for 23.6 % of total freight transport in the EU. Over the past five years, in particular rail transport lost in importance (1.3 percentage points decrease from 2011 to 2016), reaching 17.4 % in 2016, while the share of inland waterways transport fluctuated between 6 % and 7 % over this period.

23.6 %
of total freight transport in the EU was carried out via rail and inland waterways in 2016

In 2011, the European Commission adopted a roadmap of 40 concrete initiatives to reduce greenhouse gas emissions in transport by 60 % by 2050. Further information can be found in the 2011 Transport White Paper.

With the 2016 'Strategy on low-emission mobility' and the initiatives foreseen by the 2017 and 2018 'Europe on the Move' packages, the European Commission is taking action for a fundamental modernisation of European mobility and transport. The aim is to help the sector remain competitive while making a socially fair transition towards clean energy and digitalisation. Further information can be found on the website of the Directorate-General for Mobility and Transport.

Availability of infrastructure is an important factor in the choice of freight transport mode

How transport is organised depends on a country's broader logistical system and the availability of infrastructure for the various transport modes. Even though the modal split between different freight transport modes does not change substantially from year to year at the EU level, at the country level considerable differences do exist. In 2016, four countries (Latvia, Lithuania, Romania and the Netherlands) had higher freight transport shares for rail and inland waterways than for road. Particularly high shares of rail transport were reported from the Baltic countries (Latvia, Lithuania and Estonia), which is essentially linked to the transport of Russian energy products to the Baltic ports ([11]). In the Netherlands, freight transport via inland waterways still has a very important role (modal split of 45.6 % in 2016), almost matching the share of road (49.4 % in 2016) ([12]).

As of 2014, the Trans-European Transport Network (TEN-T) policy is directed towards the implementation and development of a Europe-wide network of roads, railway lines, inland waterways, maritime shipping routes, ports, airports and rail-road terminals. The ultimate objective of TEN-T is to close gaps, remove bottlenecks and eliminate technical barriers that exist between the transport networks of Member States, strengthening the social, economic and territorial cohesion of the Union and contributing to the creation of a single European transport area.

Presentation of the main indicators

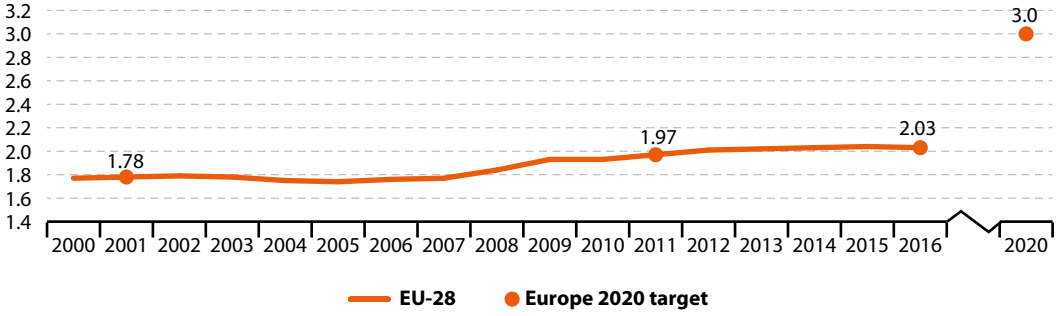
LONG TERM 2001–2016

SHORT TERM 2011–2016

Gross domestic expenditure on R&D

This indicator measures gross domestic expenditure on R&D (GERD) as a percentage of the gross domestic product (GDP). The Frascati Manual defines research and development (R&D) as creative and systematic work undertaken in order to increase the stock of knowledge — including knowledge of humankind, culture and society — and to devise new applications of available knowledge ([13]).

Figure 9.1: Gross domestic expenditure on R&D, EU-28, 2000–2016
(% of GDP)

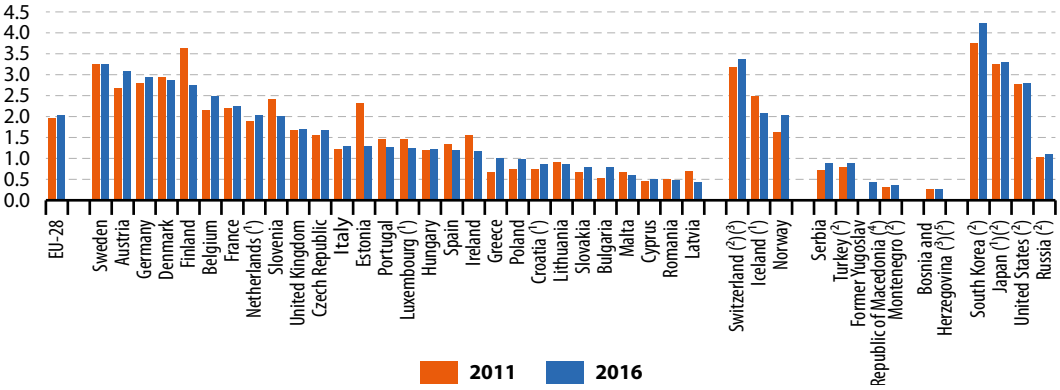


Note: Data for 2000 to 2002 are estimates, 2016 data are provisional.

Source: Eurostat (online data code: sdg_09_10)

Figure 9.1 shows that after a prolonged stagnation between 2000 and 2007, R&D intensity has grown slowly. Between 2001 and 2016, R&D intensity grew by an average of 0.9 % per year. Growth was slightly slower in the short-term period between 2011 and 2016, at 0.6 % per year on average. At the current pace of development, the Europe 2020 target of investing 3 % of GDP in R&D by 2020 will not be achieved.

Figure 9.2: Gross domestic expenditure, by country, 2011 and 2016
(% of GDP)



Note: Estimated or provisional data for many countries (too numerous to be listed).
(1) Break(s) in time series between 2011 and 2016.
(2) 2015 data (instead of 2016).
(3) 2012 data (instead of 2011).
(4) No data for 2011.
(5) 2014 data (instead of 2016).

Source: Eurostat (online data code: sdg_09_10)

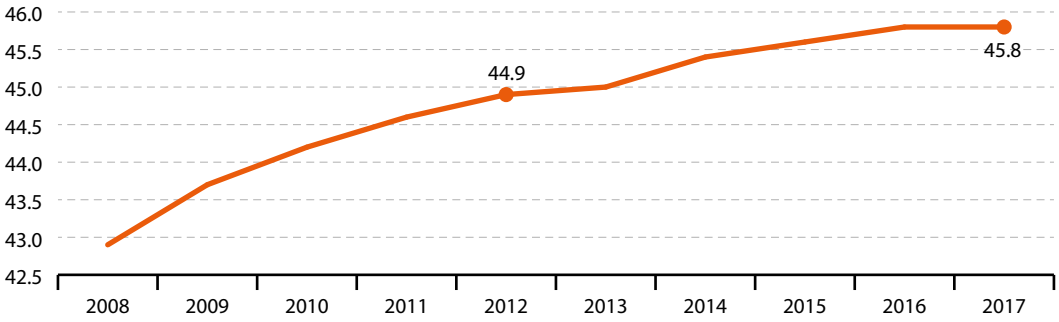
Employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors

LONG TERM
Insufficient data to calculate trend

SHORT TERM
2012–2017

The indicator measures the employment in high- and medium-high technology manufacturing sectors and in knowledge-intensive service sectors as a share of total employment. Data stem from the European Labour Force Survey (LFS). The definition of high- and medium-high technology manufacturing sectors and of knowledge-intensive services is based on a selection of relevant items of the Statistical classification of economic activities in the European Community (NACE) Rev. 2 at 2-digit level and is oriented on the ratio of highly qualified working in these areas.

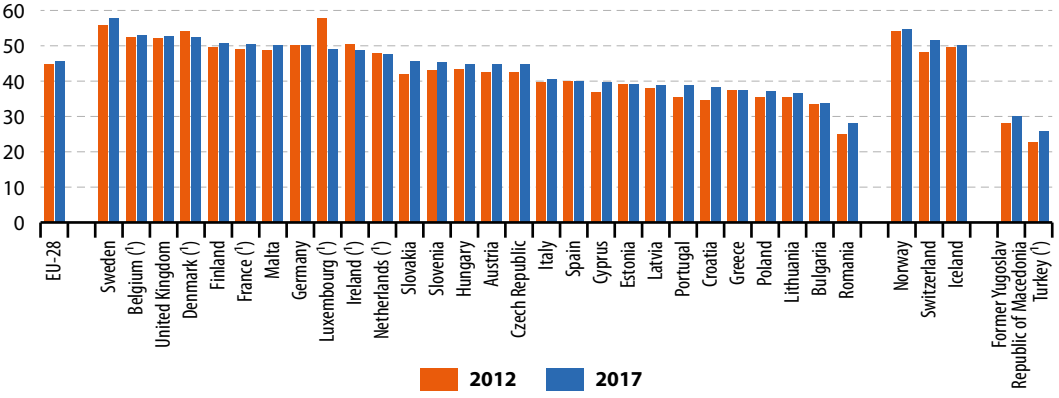
Figure 9.3: Employment in high-and medium-high technology manufacturing sectors and knowledge-intensive service sectors, EU-28, 2008–2017
(% of total employment)



Source: Eurostat (online data code: sdg_09_20)

As shown in Figure 9.3, the share of employed people working either in high- and medium-high technology manufacturing or in knowledge-intensive service sectors has grown steadily since 2008. In the short-term period since 2012, the increase has amounted to 0.4 % per year on average.

Figure 9.4: Employment in high-and medium-high technology manufacturing sectors and knowledge-intensive service sectors, by country, 2012 and 2017
(% of total employment)



(1) Break(s) in time series between 2012 and 2017.

Source: Eurostat (online data code: sdg_09_20)

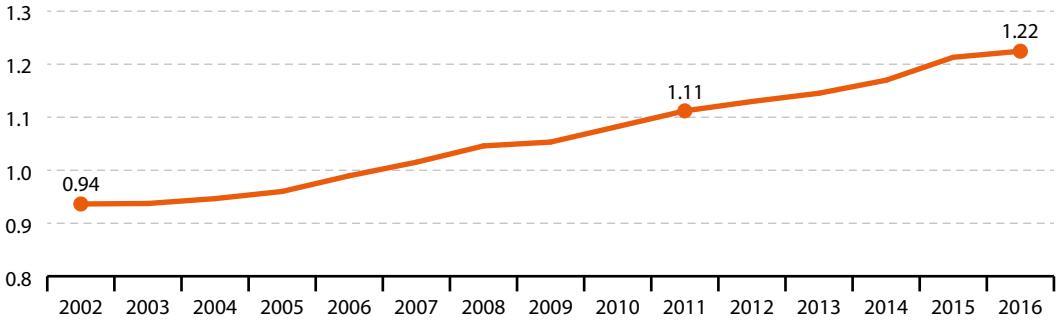
LONG TERM 2002–2016

SHORT TERM 2011–2016

R&D personnel

This indicator measures the share of R&D personnel broken down by the following institutional sectors: business enterprise, government, higher education and private non-profit. Data are presented in full-time equivalents as a share of the economically active population (the labour force).

Figure 9.5: R&D personnel, EU-28, 2002–2016
(% of active population in full-time equivalents)

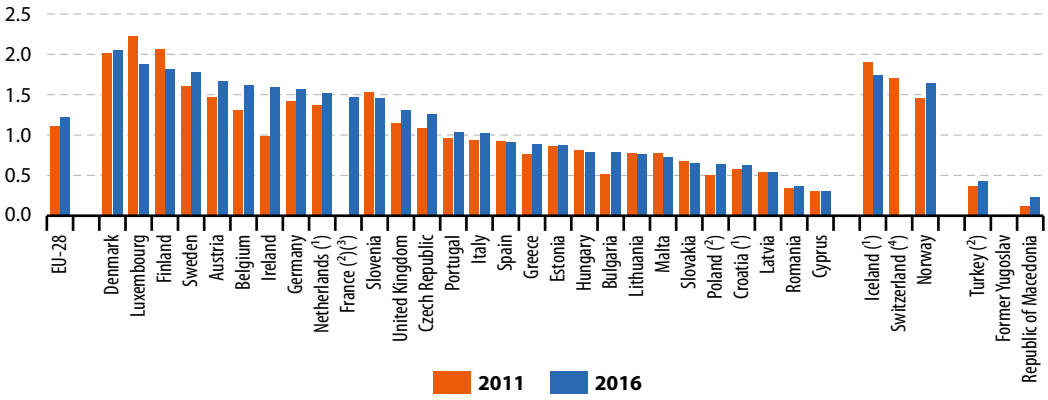


Note: Data for 2002-2013 are estimates; 2016 data are provisional.

Source: Eurostat (online data code: sdg_09_30)

R&D personnel makes up an ever increasing share of the labour force, as shown in Figure 9.5. Both in the long-term period between 2002 and 2016, and in the short-term period between 2011 and 2016, the share of R&D personnel in the active population increased by 1.9 % per year on average.

Figure 9.6: R&D personnel, by country, 2011 and 2016
(% of active population in full-time equivalents)



(1) Break(s) in time series between 2011 and 2016.
(2) 2015 data (instead of 2016).
(3) No data for 2011.
(4) Only 2012 data available.

Source: Eurostat (online data code: sdg_09_30)

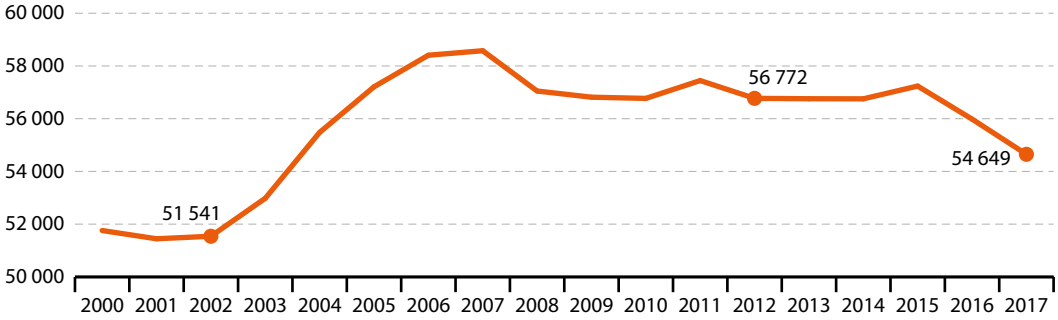
Patent applications to the European Patent Office (EPO)

LONG TERM 2002–2017

SHORT TERM 2012–2017

This indicator measures the requests for protection of an invention directed either directly to the European Patent Office (EPO) or filed under the Patent Cooperation Treaty and designating to the EPO (Euro-PCT), regardless of whether they are granted or not. The data show the total number of applications per country. If one application to the EPO has more than one inventor, the application is divided equally among all of them and subsequently among their countries of residence, thus avoiding double counting. Euro-PCT applications are allocated according to the nationality of the first listed applicant.

Figure 9.7: Patent applications to the European Patent Office, EU-28, 2000–2017
(number)

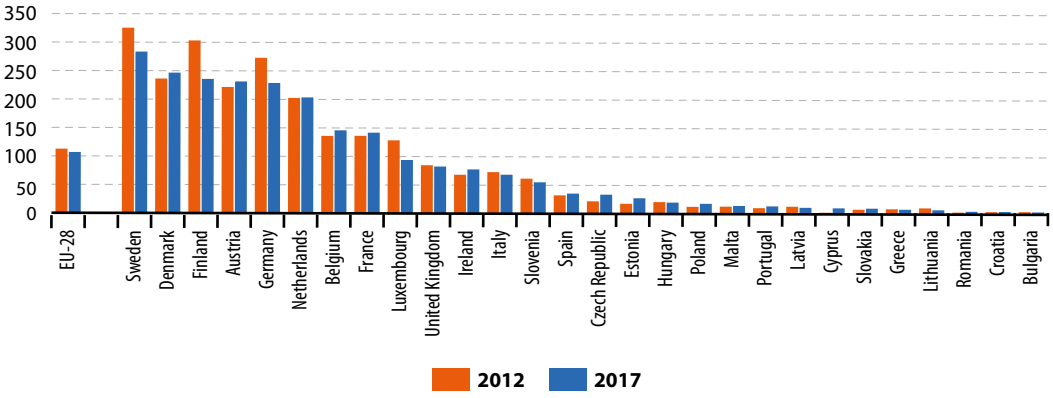


Note: Data for 2013-2017 are estimates.

Source: Eurostat (online data code: sdg_09_40)

Figure 9.7 shows that patent applications in the EU had increased considerably prior to the economic crisis, and have more or less stagnated ever since, with a slight decrease since 2015. The average increase for the long-term period from 2002 to 2017 amounts to 0.4 % per year. In the short-term period since 2012, patent applications have fallen at an average annual rate of 0.8 %.

Figure 9.8: Patent applications to the European Patent Office, by country, 2012 and 2017
(number per million inhabitants)



Note: Data for 2017 are estimates.

Source: Eurostat (online data code: sdg_09_40)

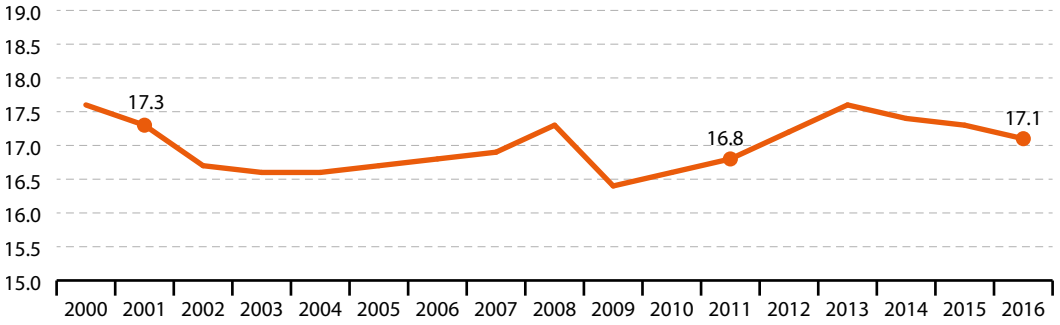
LONG TERM 2001–2016

SHORT TERM 2011–2016

Share of buses and trains in total passenger transport

This indicator measures the share of buses, including coaches and trolley-buses, and trains in total passenger transport performance, expressed in passenger-kilometres (pkm). Total passenger transport here includes transport by passenger cars, buses and coaches, and trains, and excludes air and sea transport. All data should be based on movements within national territories, regardless of the nationality of the vehicle. The data collection is voluntary and not fully harmonised at the EU level. Other collective transport modes, such as tram and metro systems, are not included due to the lack of harmonised data.

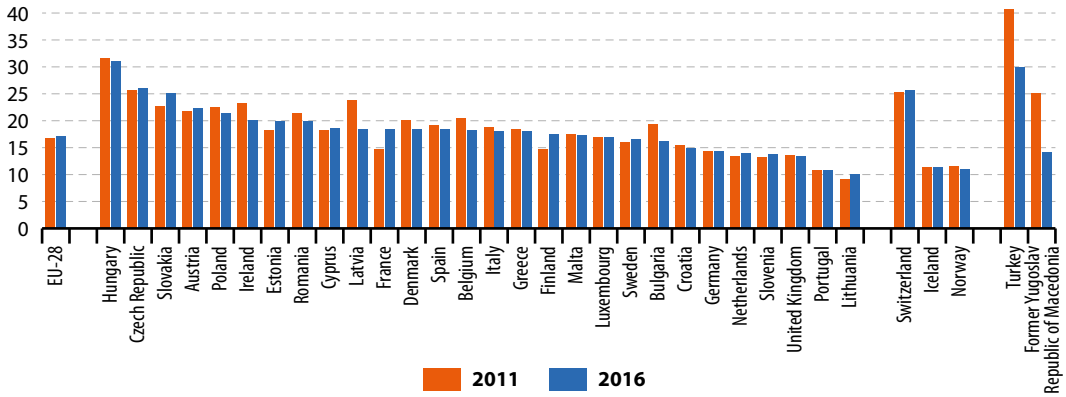
Figure 9.9: Share of buses and trains in total passenger transport, EU-28, 2000–2016
(% of total inland passenger-km)



Source: Eurostat (online data code: sdg_09_50)

Figure 9.9 shows that in the long-term period since 2001 the share of buses and trains in total passenger transport has fallen moderately, with an average annual decline of 0.1 %. In contrast, in the short-term period between 2011 and 2016 the share increased slightly, with an annual average growth rate of 0.4 %.

Figure 9.10: Share of buses and trains in total passenger transport, by country, 2011 and 2016
(% of total inland passenger-km)



Note: Data for most countries are estimates.

Source: Eurostat (online data code: sdg_09_50)

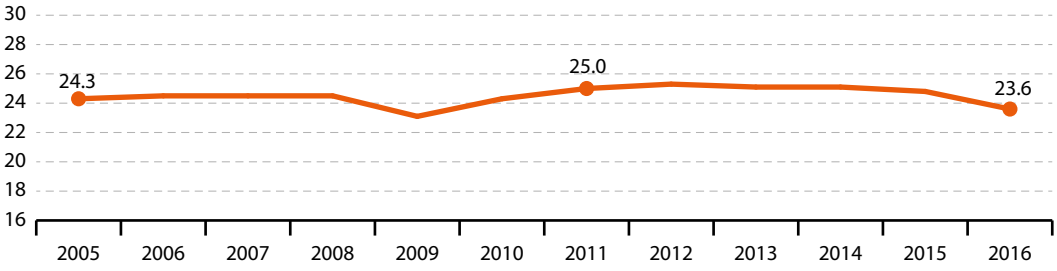
Share of rail and inland waterways activity in total freight transport

LONG TERM 2005–2016

SHORT TERM 2011–2016

This indicator measures the share of rail and inland waterways in total inland freight transport, expressed in tonne-kilometres (tkm). Inland freight transport modes include road, rail and inland waterways. Rail and inland waterways transport is based on movements on national territory, regardless of the nationality of the train or vessel. Road transport is based on all movements of vehicles registered in the reporting country. The redistribution of road transport according to the 'territoriality principle' involves modelling the likely journey itinerary and projecting it on to the European road network. Neither sea nor air freight transport are represented in the indicator.

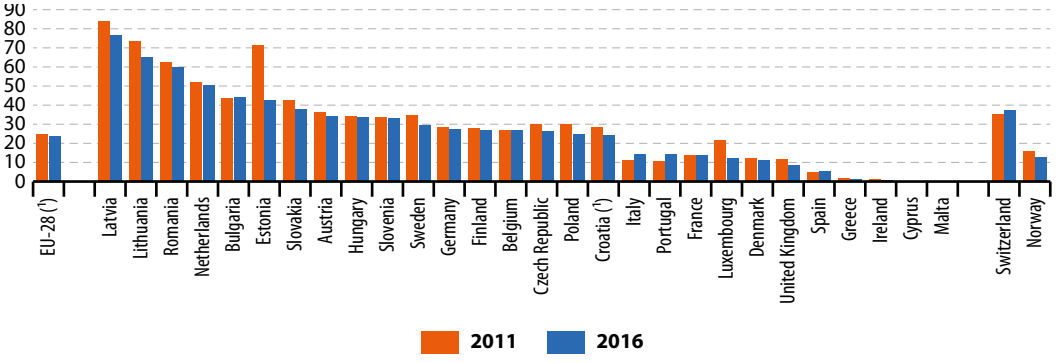
Figure 9.11: Share of rail and inland waterways activity in total freight transport, EU-28, 2005–2016
(% of total inland freight tonne-km)



Source: Eurostat (online data code: sdg_09_60)

Similar to the modal split of passenger transport, the choice of transport mode for inland freight has not changed substantially since 2005. Between 2005 and 2016, the share of rail and inland waterways in total freight transport fell by 0.3 % per year on average. In the short-term period since 2011, the decline has even been stronger, at an average of 1.1 % per year.

Figure 9.12: Share of rail and inland waterways activity in total freight transport, by country, 2011 and 2016
(% of total inland freight tonne-km)



(1) 2016 data are estimates.

Source: Eurostat (online data code: sdg_09_60)

Further reading on industry, innovation and infrastructure

European Commission (2018), *Science, Research and Innovation performance of the EU.*

European Court of Auditors (2016), *Rail freight transport in the EU: still not on the right track*.

European Commission (2011), *Roadmap to a Single European Transport Area — Towards a competitive and resource efficient transport system*.

United Nations Secretary-General's High-Level Advisory Group on Sustainable Transport (2016), *Mobilizing Sustainable Transport for Development*, New York, United Nations.

Further data sources on industry, innovation and infrastructure

European Commission (2017), European Innovation Scoreboard, EU Member States' Innovation Performance.

OECD (2015), OECD Science, Technology and Industry Scoreboard 2015: Innovation for growth and society.

Notes

(1) European Council (2010), *European Council conclusions*, 17 June 2010, EUCO 13/10, Brussels.
(2) European Commission (2017), EU R&D Scoreboard, The 2017 EU Industrial R&D Investment Scoreboard.
(3) Reinstaller, A., Unterlass, F., (2012), *Comparing business R&D across countries over time: a decomposition exercise using data for the EU27*, Applied Economics Letters, 19:12, pp. 1143–1148.
(4) European Commission (2013), Innovation Union Competitiveness Report.
(5) Source: Eurostat (online data code: rd_p_persocc).
(6) European Commission (2015), *She Figures 2015*, p. 20.
(7) European Commission (2015), *She Figures 2015*.
(8) Source: Eurostat (online data code: tran_hv_psmod).
(9) Source: Eurostat (online data code: sdg_12_30).
(10) European Commission (2017), *Commission Recommendation (EU) 2017/948 of 31 May 2017 on the use of fuel consumption and CO_2 emission values type-approved and measured in accordance with the World Harmonised Light Vehicles Test Procedure when making information available for consumers pursuant to Directive 1999/94/EC of the European Parliament and of the Council*.
(11) Eurostat (2018), *Freight transport statistics — modal split*.
(12) Source: Eurostat (online data code: tran_hv_frmod).
(13) OECD (2015), *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development*, Paris, OECD Publishing, § 1.32.

10 Reduce inequality within and among countries

Goal 10 addresses inequalities within and among countries. It calls for nations to reduce inequalities in income, as well as those based on age, sex, disability, race, ethnicity, origin, religion or economic or other status within a country. The Goal also addresses inequalities among countries, including those related to representation, and calls for the facilitation of orderly and safe migration and mobility of people.

eurostat supports the SDGs

It is widely agreed that economic prosperity alone will not achieve social progress. Economic growth that does not include all parts of society risks leaving behind unrealised human potential, damaging social cohesion, hindering economic activity and undermining democratic participation, to name a few examples. Although economists believe some inequality is necessary for market economies to function effectively because it provides the incentives needed for investment and growth, an ever-widening gap between the rich and the poor is a matter of concern. Inequalities between countries can be reduced by encouraging development assistance and foreign direct investment to the regions with the greatest need. Because rising income inequality within countries drags down economic growth and stalls progress in poverty reduction, health and well-being, the EU seeks to reduce income poverty in the EU Member States by increasing the income of low-income households. Moreover, the EU aims to promote social inclusion by facilitating safe migration and mobility of people.

Table 10.1: Indicators measuring progress towards SDG 10, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Inequalities within countries			
Inequality of income distribution	↘ (1)	↘	page 190
Income share of the bottom 40 % of the population	↘ (1)	↘	page 191
Relative median at-risk-of-poverty gap	↘ (1)	↓	page 192
People at risk of income poverty after social transfers (*)	↘ (1)	↘	SDG 1, page 40
Inequalities between countries			
Purchasing power adjusted GDP per capita	↑ (2)	↗ (2)	page 193
Adjusted gross disposable income of households per capita	↑ (2)	↑ (2)	page 194
EU financing to developing countries (*)	↑	↓	SDG 17, page 323
EU imports from developing countries (*)	↑	↑	SDG 17, page 324
Migration and social inclusion			
Asylum applications	:	:	page 195

(*) Multi-purpose indicator.
(1) Past 11-year period; trend refers to EU-27.
(2) Calculation of trend based on coefficient of variation.

Table 10.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
🎯	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Reduced inequalities in the EU: overview and key trends

Monitoring SDG 10 in an EU context focuses on inequalities within countries, inequalities between countries, and migration and social inclusion. While economic disparities between EU countries have reduced over time, income inequalities within Member States have increased. Social inclusion in the EU has also been challenged by an unprecedented surge of migration into the EU over the past few years.

Inequalities within countries

High levels of inequality harm society in many ways. They can hamper social cohesion, result in lost opportunities for many and reduce social trust in institutions ([1]). Inequality within EU Member States seems to be gradually rising. Although many factors have played a role, technological innovation and financial globalisation, favouring people with specific skills and those with accumulated wealth, have been important driving forces behind rising inequality within countries ([2]).

The gap between the rich and the poor in the EU is widening slightly

One of the objectives of the social policies in the EU is to reduce inequality by providing equal opportunities for all ([3]). However, inequality of opportunities and inequality of outcomes (such as income inequality) are closely interdependent: equal outcomes cannot be achieved without equal opportunities, but equal opportunities cannot be achieved when households begin from greatly unequal starting points ([4]). Analysing the inequality of income distribution is one of the ways to measure inequality within EU countries. The income quintile share ratio compares the income received by the 20 % of the population with the highest disposable income to that received by the 20 % of the population with the lowest disposable income. The higher this ratio, the bigger the income inequality. In the EU, this ratio has increased by 0.2 points since 2005 and has stagnated at a ratio of 5.2 over the last three years. This means that the richest 20 % of households have income that is about five times as much as the poorest 20 %.

In 2016, the income of the richest 20 % of the households in the EU was 5.2 times higher than that of the poorest 20 %

Widening inequality can also be observed when looking at the income share of the bottom 40 % of the population in the total equivalised disposable income. Their income share has been shrinking over time, from 21.5 % in 2005 to 20.9 % in 2016.

20.9 %

Share of total income earned by the bottom 40 % of the EU population in 2016

The deterioration in the income share of the bottom 40 % of the income distribution since 2005 confirms the trend of widening income inequalities despite the economic recovery. One reason for this might be the disproportionate effect of labour market improvements during the recovery, which have generally favoured high-income households ([5]). Despite recent reductions in unemployment (see the chapter on SDG 8 'Decent work and economic growth' on page 155), the levels of long-term unemployment, joblessness and inactivity remain high among certain population groups (for example, low-skilled people, people with disabilities and migrants). In addition, high disparities among workers in terms of job quality, work contracts or job security continue to weigh heavily on low-income households.

Between 2010 and 2014, labour incomes almost recovered to their pre-crisis levels on average, but not among low-income earners. This is likely to have contributed to declines in the income share of the bottom 40 % of earners. Households at the lower end of the income distribution are also more affected by financial distress and are therefore more vulnerable to income shocks. According to the 2017 Annual Review of Employment and Social Developments in Europe ([6]), 10 % of adults in the low-income quintile were in debt and a further 15 % drew on savings to cover current expenditure, compared to 5 % and 10 % for the total population, respectively ([7]).

The European Pillar for Social Rights ([8]) sets out a number of key principles to support fair and well-functioning labour markets and welfare systems. Those principles address topics related to inequality, by tackling both inequality of outcomes (income inequality) and inequality of opportunities: from wage-setting to social protection systems (including minimum income), gender equality, enabling social services, childcare and support to children, old-age income, health care and access to housing.

The poor become poorer in the EU and the number of the poor is increasing

Another way to measure inequality of outcomes within countries is by looking at income poverty as inequality and poverty are closely interrelated. The distribution of resources within a country has a direct impact on the extent and depth of poverty. In 2016, 86.9 million people — 17.3 % of the EU population — were at risk of poverty after social transfers. People are considered to be at risk of income poverty when their equalised disposable income (after social transfers) is below the at-risk-of-poverty threshold, which is set at 60% of the national median equalised disposable income after social transfers.

17.3 %
of the EU population were at risk of poverty after social transfers in 2016

The number of people living in income poverty in the EU has risen substantially since 2005 (+ 8.3 %), with the largest increases occurring in recent years. Furthermore, the average distance of those at risk of poverty from the poverty threshold has increased: in 2016, this gap amounted to 25.0 % of the poverty threshold in the EU. This represents an increase of 1.7 percentage points since 2005 ([9]). The growth of this gap has accelerated since 2011. Vulnerable groups of the population, including children, people with disabilities, migrants and Roma, are more likely to be at risk of poverty and social exclusion ([10]).

25.0 %
Distance from the poverty threshold for those at risk of poverty in 2016

Inequalities between countries

We live in an interconnected world, where problems and challenges — be they poverty, climate change, migration or economic crises — are rarely confined to one country or region. Therefore, combating inequalities between countries and world regions is important, not only from a social justice perspective but also as a prerequisite for solving many interdependent problems. In particular, sharing prosperity and reducing trade barriers allow nations to cooperate on meeting global challenges, which by definition cannot be addressed by the EU alone. Cohesion between Member States is also one of the objectives of the EU, as mentioned in the Treaty on European Union (article 3.3) ([11]).

Economic disparities between EU countries have reduced over time

Not only have economic performances, incomes and living standards improved across the EU as a whole over time, they have also been converging

between countries. Two indicators are used to measure this convergence and they both show that inequalities between the EU countries have decreased over the past 10 years.

The coefficient of variation in GDP per capita in purchasing power standard (PPS) — calculated as the ratio of the standard deviation to the mean — shows that economic disparities in GDP per capita between Member States narrowed slightly between 2002 and 2017, reaching 40.8 % in 2017. According to the 2016 Annual Review of Employment and Social Developments in Europe ([12]), this was mainly a result of rising GDP in countries that joined the EU in 2004 and later. Most of this convergence took place in the period leading up to the economic crisis of 2008 to 2009.

40.8 %
variation in GDP per capita between Member States in 2017

While GDP per capita is used to measure the economic performance of a country, adjusted gross household disposable income provides an indication of the average material well-being of people. Gross household disposable income reflects the purchasing power of households and their ability to invest in goods and services or save for the future, by accounting for taxes, social contributions and in-kind social benefits.

The two indicators differ, as GDP per capita measures income that might not necessarily accrue to households and does not capture household income received from investments abroad, for example, in the form of dividends and interest receipts. In contrast to the coefficient of variation in GDP per capita, recent developments in gross household disposable income across the EU do not point to a short-term stagnation, but rather a further improvement, reaching a coefficient of variation of 25.8 % in 2016, which is 4.6 percentage points less than in 2011, though the drivers of this change remain unclear.

Clear north–south and west–east divides between EU countries, despite overall reduction in economic disparities

25.8 %
variation in household disposable income across the EU in 2016

A clear north–south and west–east divide is evident when looking at the geographical distribution of GDP per capita and income of households in the EU in 2016. EU citizens living in northern and western European countries with above average GDP per capita levels had the highest gross disposable income per capita. On the other end of the scale were eastern and southern EU countries, which displayed gross household disposable incomes and GDP per capita levels below the EU average.

This divergent pattern is broadly reflected in other fields of economic performance such as employment, R&D expenditure and resource productivity (see chapters on SDG 8 'Decent work and economic growth' on page 154, SDG 9 'Industry, innovation and infrastructure' on page 169 and SDG 12 'Responsible consumption and production' on page 219) as well as in social dynamics in terms of levels of poverty and social exclusion (see chapter SDG 1 'No poverty' on page 31).

EU cohesion policy promotes economic, social and territorial cohesion by investing in smart, sustainable and inclusive growth in all EU regions. The European Structural and Investment Funds are the financial instrument for implementing these policy actions.

The drivers behind such west-east and north-south divergences are difficult to track. For the west-east divide, the long-lasting effects of communist regimes and the following transition to capitalism together with later accession to the

EU might be the reasons for the weaker economic performance in some countries ([13]).

The EU's different forms of assistance to developing countries have risen over the recent decade

The EU's values of social and economic justice and equality apply not just to its own territories but also to global development in general. The assistance given by the EU and its Member States to developing countries is an expression of solidarity with their efforts to eradicate poverty and vulnerability, improve their populations' well-being and achieve sustainable development.

The EU's commitment to reducing inequalities between countries goes beyond official development assistance (ODA). In line with the new European Consensus on Development, the EU takes a comprehensive approach to development cooperation, drawing on the framework agreed through the Addis Ababa Action Agenda, combining aid with other financial and non-financial resources, with sound policies and a strengthened approach to Policy Coherence for Development. For instance, trade openness is another means of helping countries to achieve lasting economic development and independence from ODA. Through trade cooperation, the EU aims to help developing and least-developed countries join the global economy and reap the benefits it provides for economic specialisation, growth and job creation.

The EU's impact on reducing inequalities between countries can be measured by two indicators: EU financing to developing countries and EU imports from developing countries. Over the past decade both the financial help given to developing countries and imports from developing countries has increased significantly. Total EU financing for developing countries, encompassing flows from the public and private sector, has more than doubled since 2001, representing an average annual growth of 6.4 %. However, EU financing fell by 18.7 % in 2016, which led to an annual average decrease of 1.2 % in the short-term period since 2011. For the first time since 2009, official development assistance became the largest source for development financing. Overall, EU financing for developing countries amounted to almost EUR 145 billion in 2016.

145
billion EUR were spent by the EU on financing to developing countries in 2016

957
billion EUR Value of EU imports from developing countries in 2017

EU imports from developing countries also more than doubled between 2002 and 2017, from EUR 359 billion to EUR 957 billion, which is a new highpoint. Growing imports from China have been a decisive factor behind the long-term growth in EU imports. For more information on the different forms of the EU's assistance to developing countries, see the chapter on SDG 17 'Partnership for the goals' on page 315.

Migration and social inclusion

The number of irregular border crossings and asylum applications in the EU remains high

The Syrian conflict, the ongoing war in Iraq and unstable situations in Afghanistan and some African countries have contributed to an unprecedented surge of migration into the EU over the past few years. People fleeing from the conflicts and war situations, as well as economic migrants, are sometimes forced to violate the migration laws of the EU Member States by overstaying their visas or by crossing borders illegally. In 2017, Member States detected 204 719 illegal border crossings along the EU's external borders ([14]). This represents an 89 % decrease compared to 1.8 million detections at the height of the so-called refugee crisis in 2015 ([15]). Despite this, the absolute number of detections in 2017 exceeded any number of detections recorded

in recent history between 2008 and 2013. This indicates that pressure on the EU's external borders remains high.

The urge to seek international protection is one of the main reasons that forces people to cross borders illegally. In 2017, the EU received 654 610 first-time asylum applications (equalling 1 278 applications per million inhabitants), which is almost 50 % less then at the height of the refugee crisis in 2015 but still a 4.3 times increase in comparison to 2008. During 2017, 442 925 people received a positive decision granting protection status at first instance in the EU.

Despite the unprecedented increase in first-time asylum applications in the EU between 2008 and 2017, the figure for 2017 marked a decrease of more than half a million of first-time applicants (45.7 %) in comparison with the year before. Such a rapid decrease might be connected with the overall reduction in the number of arrivals to the EU due to stricter border controls ([16]). This has partly been influenced by the closure of the Western Balkans route ([17]) in early March 2016 and the EU-Turkey Statement of 18 March 2016 ([18]), which have made the irregular flow of people towards central and northern Europe more difficult and has forced migrants to use different routes across the Mediterranean (the Central Mediterranean route from North Africa to Italy; the Eastern Mediterranean route from Turkey to Greece, Bulgaria and Cyprus; and the Western Mediterranean route from North Africa to Spain) ([19]).

654 610
first-time asylum applications were submitted in the EU in 2017

The largest groups of first-time asylum applicants in Member States in 2017, accounting for more than one-third of all first-time applicants, were Syrians (102 375), Iraqis (47 650) and Afghans (43 800). The distribution of first-time asylum applicants by sex shows that men were overrepresented among those seeking asylum, with about two in three (66.8 %) asylum seekers being male. Many of those men arrive first, hoping to find a safe place to live or work before trying to reunite with their families ([20]).

In 2017, 442 925 asylum applicants received a positive decision at first instance, entitling them to remain in the EU and receive international protection, up from 57 945 in 2008. Half of them (50.1 %) were granted refugee status under the Geneva Convention ([21]), which establishes protection for civilians due to a well-founded fear of persecution. More than a third (35.6 %) of those with a positive asylum decision did not meet the criteria for the recognition as refugees under the Geneva Convention, but received subsidiary protection because of a real risk of suffering serious harm if they returned to the country of origin ([22]). Finally, 14.2 % of those with positive decisions were granted authorisation to stay for humanitarian reasons ([23]).

The European Commission's Knowledge Centre for Migration and Demography provides knowledge and evidence-based analysis for policy developments and decisions related to saving migrants' lives and securing the external borders, strengthening the common asylum policy and developing a new policy on legal migration. The Asylum, Migration and Integration Fund provide financial support for these actions.

The Fund for European Aid to the Most Deprived (FEAD) may support asylum seekers by providing them with immediate relief (food, clothing and other essential items for personal use). However, Member States define the target groups individually and the scope of support by FEAD depends on the scope of the national programme.

The proposed European Solidarity Corps will enable young people across the EU to volunteer their help for the reception and integration of refugees.

Presentation of the main indicators

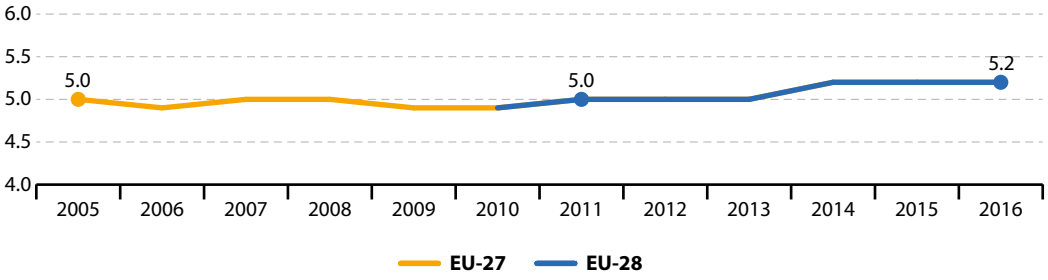
LONG TERM 2005–2016

SHORT TERM 2011–2016

Inequality of income distribution

Inequality of income distribution is measured by the ratio of total equivalised disposable income received by the 20% of the population with the highest income (top quintile) to that received by the 20% of the population with the lowest income (lowest quintile). Equivalised disposable income is the total income of a household (after taxes and other deductions) that is available for spending or saving, divided by the number of household members converted into equalised adults. Data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

Figure 10.1: Inequality of income distribution, EU-27 and EU-28, 2005–2016
(income quintile share ratio)

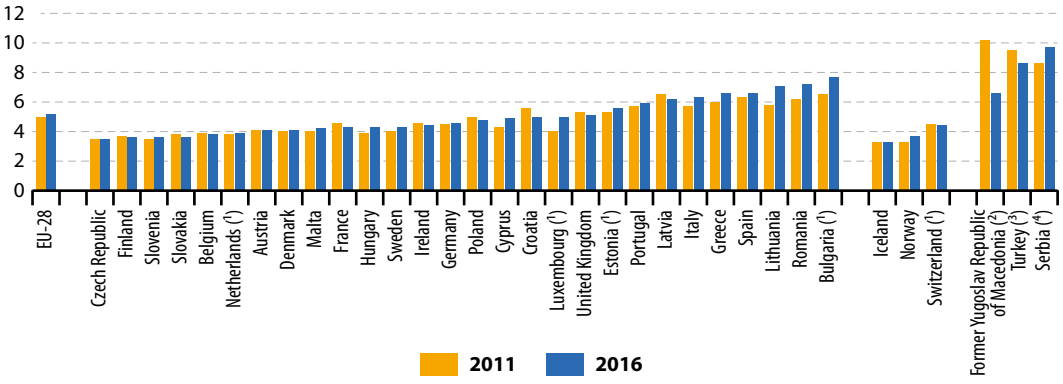


Note: 2006 data are estimates.

Source: Eurostat (online data code: sdg_10_41)

Inequality of income distribution in the EU has remained rather stable during the past decade. The average annual growth rate in the EU-27 amounted to 0.4% between 2005 and 2016 and to 0.8% in the short-term period between 2011 and 2016. The ratio remained unchanged over the past three years.

Figure 10.2: Inequality of income distribution, by country, 2011 and 2016
(income quintile share ratio)



(1) Break(s) in time series between 2011 and 2016.
(2) 2012 data (instead of 2011).
(3) 2015 data (instead of 2016).
(4) 2013 data (instead of 2011).

Source: Eurostat (online data code: sdg_10_41)

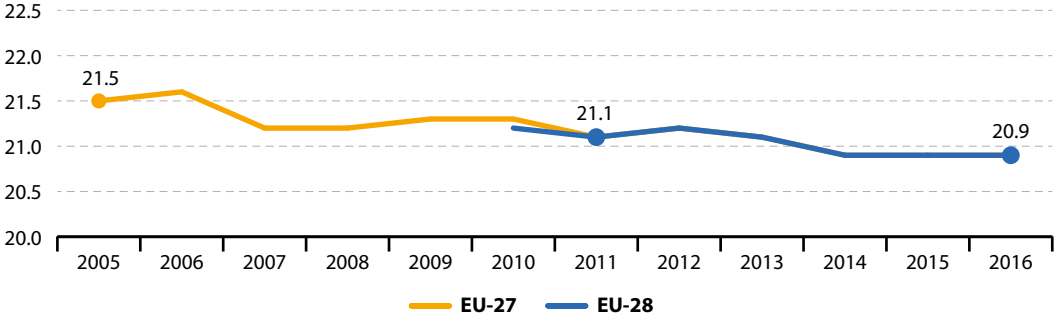
Income share of the bottom 40 % of the population

LONG TERM 2005–2016

SHORT TERM 2011–2016

This indicator measures the income share received by the bottom 40 % of the population (in terms of income). The income concept used is the total disposable household income, which is the total income of a household (after taxes and other deductions) that is available for spending or saving. Data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

Figure 10.3: Income share of the bottom 40 % of the population, EU-27 and EU-28, 2005–2016
(% of income)

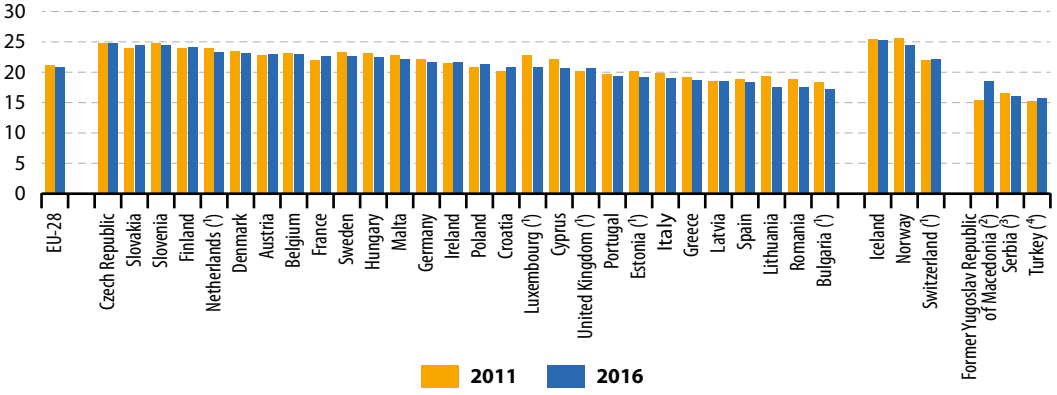


Note: 2005 data are estimates.

Source: Eurostat (online data code: sdg_10_50)

The income share of the bottom 40 % of the population in the EU-27 fell by 0.3 % per year on average between 2005 and 2016. The decrease was less pronounced in the short-term period, with an annual average decline of 0.2 %. This indicates that on average, total incomes in Member States have grown more strongly than those of the poorer population.

Figure 10.4: Income share of the bottom 40 % of the population, by country, 2011 and 2016
(% of income)



(1) Break(s) in time series between 2011 and 2016.
(2) 2012 data (instead of 2011).
(3) 2013 data (instead of 2011).
(4) 2015 data (instead of 2016).

Source: Eurostat (online data code: sdg_10_50)

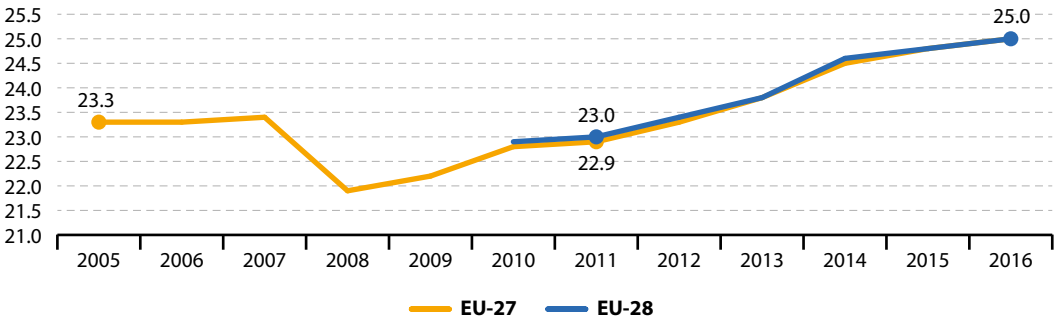
LONG TERM 2005–2016

SHORT TERM 2011–2016

Relative median at-risk-of-poverty gap

The relative median at-risk-of-poverty gap helps to quantify how poor the poor are by showing the distance between the median income of people living below the poverty threshold and the threshold itself, expressed in relation to the threshold. This threshold is set at 60 % of the national median equivalised disposable income of all people in a country and not for the EU as a whole. Data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

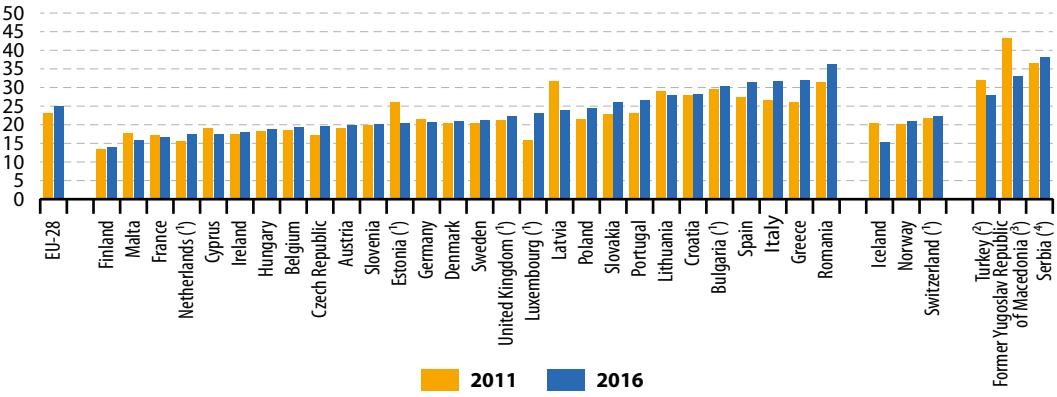
Figure 10.5: Relative median at-risk-of-poverty gap, EU-27 and EU-28, 2005–2016
(% distance to poverty threshold)



Source: Eurostat (online data code: sdg_10_30)

As shown in Figure 10.5, the poor have become poorer in the EU over time. Between 2005 and 2016, the relative median at-risk-of-poverty gap of the EU-27 grew by an average of 0.6 % per year. The short-term growth between 2011 and 2016 was much stronger, at an average of 1.8 % per year.

Figure 10.6: Relative median at-risk-of-poverty gap, by country, 2011 and 2016
(% distance to poverty threshold)



(1) Break(s) in time series between 2011 and 2016.
(2) 2015 data (instead of 2016).
(3) 2012 data (instead of 2011).
(4) 2013 data (instead of 2011).

Source: Eurostat (online data code: sdg_10_30)

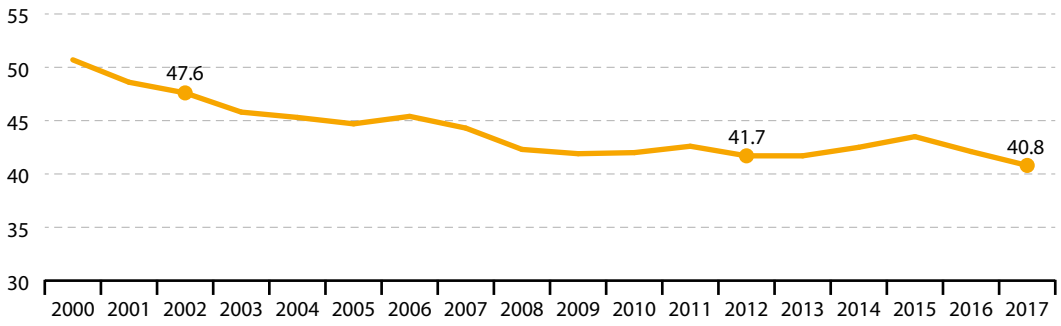
Purchasing power adjusted GDP per capita

LONG TERM 2002–2017

SHORT TERM 2012–2017

GDP per capita is calculated as the ratio of GDP to the average population in a specific year. Basic figures are expressed in purchasing power standards (PPS) ([24]), which represents a common currency that eliminates differences in price levels between countries to allow meaningful volume comparisons of GDP. The disparities indicator for the EU is calculated as the coefficient of variation of the national figures.

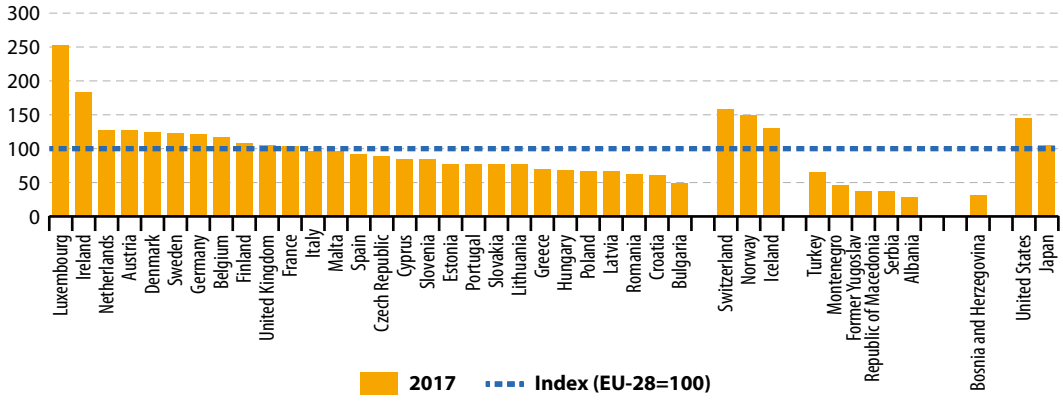
Figure 10.7: Purchasing power adjusted GDP per capita, EU-28, 2000–2017
(coefficient of variation of volume indices of expenditure per capita, in %)



Source: Eurostat (online data code: sdg_10_10)

Figure 10.7 shows that economic disparities between Member States have reduced over time, with most of the decline happening in the pre-crisis years. The coefficient of variation fell by an average of 1.0 % per year between 2002 and 2017. In the short-term period, the coefficient of variation remained more stable and the average annual decrease of 0.4 % can be attributed to the decline in 2016 and 2017.

Figure 10.8: Purchasing power adjusted GDP per capita, by country, 2017
(volume indices of real expenditure per capita in PPS (EU-28 = 100))



Source: Eurostat (online data code: sdg_10_10)

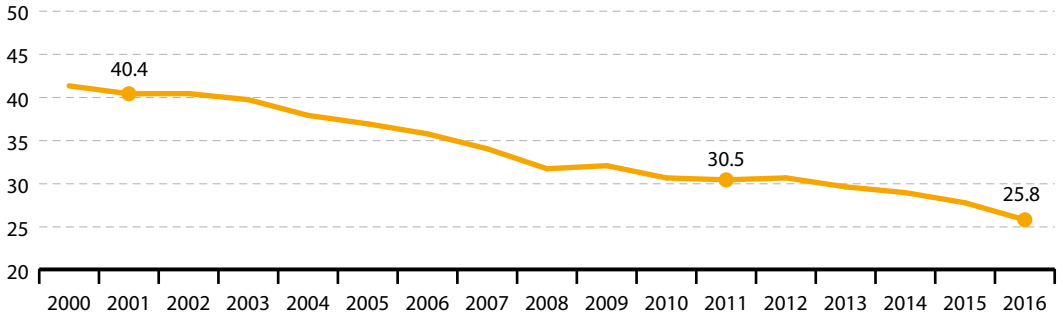
LONG TERM 2001–2016

SHORT TERM 2011–2016

Adjusted gross disposable income of households per capita

This indicator reflects the purchasing power of households and their ability to invest in goods and services or save for the future, by accounting for taxes and social contributions and monetary in-kind social benefits. The disparities indicator for the EU is calculated as the coefficient of variation of the national figures.

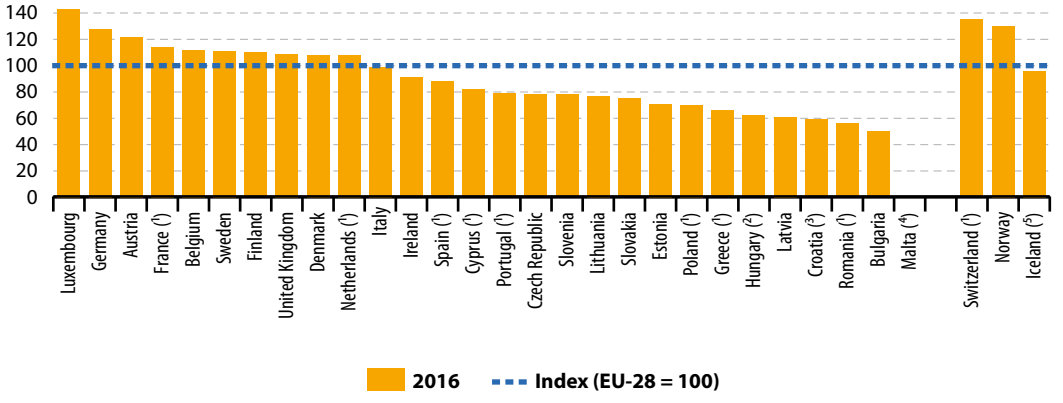
Figure 10.9: Adjusted gross disposable income of households per capita, EU, 2000–2016
(coefficient of variation, in %)



Note: EU coefficient of variation excluding Malta (whole time series), Hungary (2000–2002 and 2016) and Croatia (2000–2001 and 2013–2016).
Source: Eurostat (online data code: sdg_10_20)

Figure 10.9 shows that based on the adjusted disposable income of households, per capita inequalities between EU countries have decreased over time. Between 2001 and 2016, the coefficient of variation fell by 2.9 % per year on average. In the short-term period since 2011, the decrease has been slightly stronger, at an average of 3.3 % per year.

Figure 10.10: Adjusted gross disposable income of households per capita, by country, 2016
(index EU-28 = 100)



(1) Provisional or estimated data.
(2) 2015 data.
(3) 2012 data.
(4) No data.
(5) 2014 data.

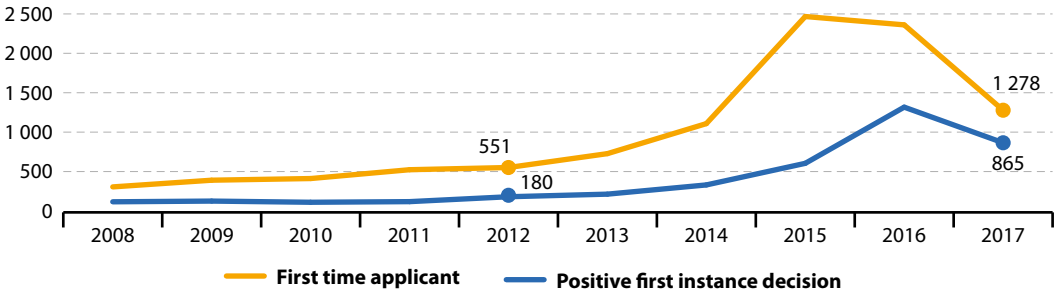
Source: Eurostat (online data code: sdg_10_20)

Asylum applications

X Indication of progress not possible

This indicator shows the number of first-time asylum applicants per million inhabitants and the number of positive first instance decisions per million inhabitants. A first-time applicant for international protection is a person who lodged an application for asylum for the first time in a given Member State. First instance decisions are decisions granted by the respective authority acting as a first instance of the administrative/judicial asylum procedure in the receiving country. The source data are supplied to Eurostat by the national Ministries of Interior and related official agencies.

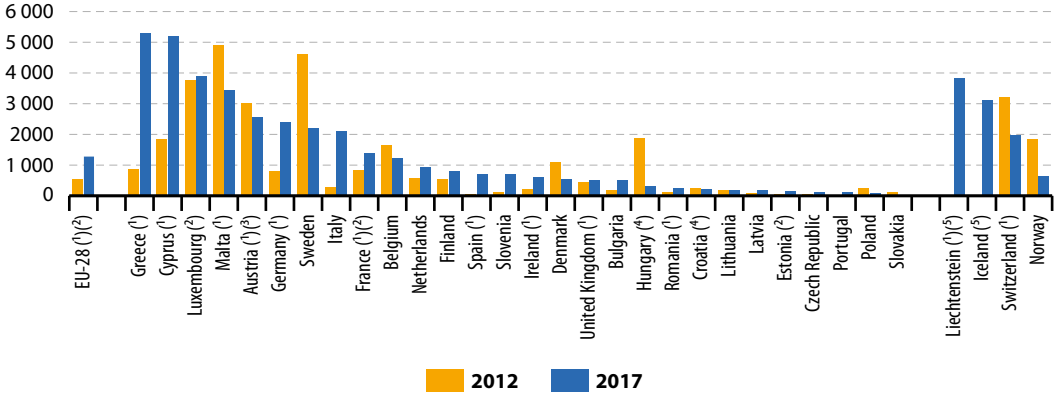
Figure 10.11: Asylum applications by state of procedure, EU-28, 2008–2017
(number per million inhabitants)



Note: breaks in time series in 2010, 2011, 2012, 2014, 2015 and 2017; data for 2013–2017 are estimates, data for 2015–2017 are provisional.
Source: Eurostat (online data code: sdg_10_60)

The number of first-time asylum applicants has increased considerably since 2008, despite a sharp decline in 2017. In absolute terms, 4.3 times more asylum seekers applied for international protection in the EU in 2017 than in 2008. The number of positive first instance decisions was even 7.6 times higher in 2017 compared with 2008 (in absolute terms).

Figure 10.12: First time asylum applications, by country, 2012 and 2017
(number per million inhabitants)



(1) 2017 data are provisional and/or estimates.
(2) Break(s) in time series between 2012 and 2017.
(3) 2014 data (instead of 2012).
(4) 2013 data (instead of 2012).
(5) No data for 2012.

Source: Eurostat (online data code: sdg_10_60)

Further reading on inequalities

Darvas, Z. and Wolff, G.B. (2016), *An anatomy of inclusive growth in Europe*, Brussels, Bruegel Blueprint series.

Eurofound (2017), *Income inequalities and employment patterns in Europe before and after the Great Recession*, Luxembourg, Publications Office of the European Union.

European Commission (2017), *Employment and Social Developments in Europe, Annual Review 2017*.

European Commission (2016), *Towards a reform of the common European asylum system and enhancing legal avenues to Europe*, COM (2016) 197 final, Brussels.

OECD (2016), *Income inequality update: Income inequality remains high in the face of weak recovery*.

OECD (2017), *How's life? 2017. Measuring well-being*.

United Nations High Commissioner for Refugees (UNHCR) (2015), *The sea route to Europe: The Mediterranean passage in the age of refugees*, Geneva.

UNHCR (2018), *Mid-year trends 2017*, Geneva.

Further data sources on inequalities

Eurostat, Gini coefficient of equivalised disposable income.

European Border and Coast Guard Agency (Frontex) (2018), Risk analysis for 2018.

Notes

(1) OECD (2017), *Understanding the socio-economic divide in Europe. Background report*.
(2) Darvas, Z. and Wolff, B. (2016), *An Anatomy of Inclusive Growth in Europe*, pp.14–15.
(3) European Parliament, European Council, European Commission (2017), *European Pillar of Social Rights*.
(4) United Nations Development Programme (2013), *Humanity divided: confronting inequality in developing countries.*
(5) OECD (2016), *Income inequality remains high in the face of weak recovery*, p. 2.
(6) European Commission (2017), *Employment and Social Developments in Europe, Annual Review 2017.*
(7) Id., p. 43.
(8) European Commission (2017), *Establishing a European Pillar of Social Rights*, COM (2017) 250 final, Brussels.
(9) Data refer to the EU-27.
(10) European Commission (2017), *Employment and Social Developments in Europe, Annual Review 2017*, p. 46.
(11) *Consolidated version of the Treaty on European Union and the Treaty on the Functioning of the European Union. 2012/C 326/01.*
(12) European Commission (2016), *Employment and Social Developments in Europe, Annual Review 2016*, p. 46.
(13) Lane, D. (2007), Post-Communist States and the European Union, *Journal of Communist Studies and Transition Politics*, 23:4, 461–477.
(14) Frontex (2018), *Risk analysis for 2018*, p. 8.
(15) Ibid.
(16) European Commission (2018), *Migration: Number of asylum applications in the EU down by 43% in 2017.*
(17) The Balkan route has been the main entry point for migrants who entered the EU through Greece and tried to make their way to western Europe via the former Yugoslav Republic of Macedonia, Serbia into Hungary and Croatia. The route became a popular passageway into the EU in 2012 when Schengen visa restrictions were relaxed for five Balkan countries: Albania, Bosnia and Herzegovina, Montenegro, Serbia and Former Yugoslav Republic of Macedonia.
(18) European Council and Council of the European Union (2016), EU-Turkey statement, 18 March 2016.
(19) UNHCR (2017), Bureau for Europe, *Desperate Journeys: Refugees and migrants entering and crossing Europe via the Mediterranean and Western Balkans routes*, p. 1–2.
(20) UNHCR (2015), *The sea route to Europe: The Mediterranean passage in the age of refugees*, p. 7.
(21) The 1951 Geneva Convention relating to the status of refugees (as amended by the 1967 New York Protocol) has, for over 60 years, defined who is a refugee, and laid down a common approach towards refugees that has been one of the cornerstones for the development of a common asylum system within the EU. Since 1999, the EU has worked towards creating a common European asylum regime in accordance with the Geneva Convention and other applicable international instruments.
(22) Council Directive 2004/83/EC of 29 April 2004 defines serious harm as the risk of: "(a) death penalty or execution; or (b) torture or inhuman or degrading treatment or punishment of an applicant in the country of origin; or (c) serious and individual threat to a civilian's life or person by reasons of indiscriminate violence in situations of international or internal armed conflict."
(23) These include people who are not eligible for international protection as currently defined in the first-stage legal instruments, but are nonetheless protected against removal under the obligations that are imposed on all Member States by international refugee or human rights instruments or on the basis of principles flowing from such instruments. Examples of such categories include people who are not removable on ill-health grounds and unaccompanied minors.
(24) The purchasing power standard (PPS) is an artificial currency unit. Theoretically, one PPS can buy the same amount of goods and services in each country. However, price differences across borders mean different amounts of national currency units are needed for the same goods and services depending on the country. PPS are derived by dividing any economic aggregate of a country in national currency by its respective purchasing power parities. PPS is the technical term used by Eurostat for the common currency in which national accounts aggregates are expressed when adjusted for price level differences using PPPs. Thus, PPPs can be interpreted as the exchange rate of the PPS against the euro.

11 Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 11 aims to renew and plan cities and other human settlements in a way that offers opportunities for all, with access to basic services, energy, housing, transportation and green public spaces, while reducing resource use and environmental impact.

eurostat supports the SDGs

Almost three-quarters of the EU population live in urban areas: cities, towns and suburbs, with more than 40 % residing in cities alone ([1]). The share of the urban population in Europe is projected to rise to just over 80 % by 2050 ([2]). Cities and communities are therefore essential for Europeans' well-being and quality of life as they serve as hubs for economic and social development and innovation. They attract many people because of the wide range of opportunities for education, employment, entertainment and culture that are available there. This large concentration of people and wealth, however, often comes with a range of complex challenges. Ensuring the sustainability of urban transport, by improving the accessibility and attractiveness of public transport systems, among other measures, is one of these challenges. Another is dealing with the negative environmental impacts arising from the large quantities of waste they generate. Cities are consequently seen as both a source of economic, enviornmental and social challenges as well as a solution to these issues. As such, they may be viewed as a key driver for achieving a sustainable future.

Table 11.1: Indicators measuring progress towards SDG 11, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Quality of life in cities and communities			
Overcrowding rate	↑ (1)(2)	↗	page 208
Population living in households considering that they suffer from noise	:	↑	page 209
Exposure to air pollution by particulate matter	↘	↑ (3)	page 210
Population living in a dwelling with a leaking roof, damp walls, floors of foundation, or rot in window frames of floor (*)	:	↗	SDG 1, page 44
Population reporting occurrence of crime, violence or vandalism in their area (*)	:	↑	SDG 16, page 305
Sustainable transport			
Difficulty in accessing public transport	:	:	page 211
People killed in road accidents	↗	↘	page 212
Share of buses and trains in total passenger transport (*)	↘	↗	SDG 9, page 178
Adverse environmental impacts			
Recycling rate of municipal waste	↑ (1)	↑	page 213
Population connected to at least secondary wastewater treatment (*)	:	:	SDG 6, page 123
Artificial land cover per capita (*)	:	↘ (4)	SDG 15, page 287

(*) Multi-purpose indicator.
(1) Trend refers to EU-27.
(2) Past 11-year period.
(3) It should be noted that although the average concentrations of fine particulate matter have decreased during the past five years, the overall adverse health impacts of urban population exposure to air pollution by particulate matter $PM_{2.5}$ remain significant. The annual mean for fine particulate matter continues to be above the World Health Organization's recommended level.
(4) Past 6-year period. Data based on EU-23 (EU-28 excluding Bulgaria, Cyprus, Croatia, Malta, Romania).

Table 11.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Sustainable cities and communities in the EU: overview and key trends

Monitoring SDG 11 in an EU context means looking at developments in the areas of quality of life in cities and communities, sustainable transport and adverse environmental impacts. Statistics by degree of urbanisation provide an analytical and descriptive lens on urban and rural areas. Based on the share of the local population living in urban clusters and in urban centres, Eurostat differentiates between the three categories of 'cities', 'towns and suburbs' and 'rural areas' ([3]). As Table 11.1 shows, the EU has achieved some progress in increasing the quality of life in cities and communities over the past few years as well as in sustainably managing waste. However, progress towards safe and sustainable transport systems has been mixed, and soil sealing by artificial areas (such as cities) has increased.

Quality of life in cities and communities

While European cities and communities provide opportunities for employment and economic activity, their inhabitants often face considerable social challenges and inequalities. Problems affecting the quality of housing and the wider residential area, such as noise disturbance, crime and vandalism, are some of the most visible challenges that cities and communities can face. These can have a direct impact on the quality of life of the population — their physical and mental health, sense of security, social cohesion and well-being.

15.4 %
of the EU population lived in poor dwelling conditions in 2016

Quality of housing in the EU improved over the past five years

Safe and adequate homes are a foundation for living an independent, healthy and fulfilling life. Poor housing conditions, on the other hand, are associated with lower life chances, health inequalities, increased risks of poverty and environmental hazards. In 2016, almost one in seven EU inhabitants (15.4 %) experienced at least one of the following basic deficits in their housing condition: leaking roof, damp walls, floors or foundation or rot in window frames or floor. This is 2.6 percentage points lower than the share of the population reporting such deficiency in living conditions in 2007 ([4]), indicating that the perceived quality of the housing stock in the EU has improved. The overcrowding rate has been reduced moderately since 2005 ([5]) as well. However, in 2016, almost one in six Europeans (16.6 %) were still living in a densely populated home, which means overcrowding was slightly more widespread in the EU than poor housing conditions.

16.6 %
of the EU population lived in overcrowded homes in 2016

More than EUR 100 billion from the European Regional Development Fund will be invested in cities to create better opportunities for sustainable urban mobility, energy efficiency, urban renewal, research and innovation capacity and economic and social regeneration of deprived communities.

Europeans perceive their residential areas as quieter and safer, but exposure to air pollution remains an issue

The wider residential environment can be equally important for well-being as the quality of one's housing. Noise disturbance, air pollution as well as crime and vandalism can negatively affect the quality of life and housing satisfaction in a residential area. These factors can lead to property loss or damage as well as to increasing health risks. Living in loud, unsafe environments can cause stress and anxiety. Pollutants such as tiny particles of matter suspended in the air reduce people's life expectancy and perception of well-being. In 2016, 17.9 % of the EU population lived in a household where they believed they suffered from noise, compared to 23.0 % in 2007 ([6]). Crime, violence and vandalism were perceived in their area by 13.0 % of the EU population in 2016, compared to 14.1 % in 2011. The population-weighted annual mean concentration of fine particulate matter ($PM_{2.5}$) in urban areas decreased by 20 % between 2010 and 2015 but, at 14.5 µg/m^3 in 2015, remained slightly above the 2000 level.

17.9 %
of the EU population experienced noise disturbance in 2016

Prolonged exposure to loud and variable noise, for example from traffic, industry or construction, poses a high environmental risk to human health. It can lead to high blood pressure, sleep disturbance, cardiovascular diseases, cognitive impairment and mental health problems ([7]). The harmful effects of noise arise mainly from the stress reactions caused in the human body, which can also manifest themselves during sleep. The WHO has categorised noise from road traffic as the second most harmful environmental stressor in Europe, behind air pollution from fine particulate matter. According to the European Environment Agency (EEA) estimations, road traffic noise, both inside and outside urban areas, is still the dominant source of noise affecting human health. Based on modelling calculations from 2017, it is estimated that around 100 million people are exposed to road traffic noise above 55 dB L_{den} (day–evening–night noise level) ([8]) in Europe. Of these, 32 million are estimated to be exposed to very high noise levels above 65 dB L_{den}. Railways are the second most common source of noise, with an estimated 19 million people exposed to levels above 55 dB L_{den} in Europe. Aircraft noise, with more than 4.1 million people estimated to be exposed to levels above 55 dB L_{den}, is the third main noise source, followed by industrial noise within urban areas, with 1.0 million people estimated to be exposed ([9]).

Despite recent improvements, exposure of the urban population to fine particular matter remains high

High concentrations of people and industry, through the density of related activities and

The Environmental Noise Directive is the main EU instrument for identifying and combating noise pollution. It focuses on three action areas: (a) determination of exposure to environmental noise; (b) ensuring that information on environmental noise and its effects is made available to the public; and (c) preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and preserving environmental noise quality where it is good. The Directive requires Member States to prepare and publish every five years noise maps and noise management action plans for agglomerations with more than 100 000 inhabitants, major roads, railways and airports. When developing such plans, Member States' authorities are required to consult the public concerned.

The EU addresses the problem of air pollution through its specific air quality and industrial emissions legislation, such as the Clean Air Package and the Directives adopted by the Council and the European Parliament in relation to ambient air quality, as well as through co-benefits resulting from implementation of certain climate policies.

transport movements, significantly increase exposure to air pollution. Poor air quality represents a major environmental and health risk. Exposure to fine particulate matter can lead to or aggravate many chronic and acute respiratory and cardiovascular diseases ([10]).

In 2015, the EU average urban population exposure to $PM_{2.5}$, at a concentration of 14.5 µg/m^3, was below the limit value established by the EU from 2015 onward (25 µg/m^3 annual mean) ([11]). However, substantial air pollution hotspots remain, and the annual mean for fine particular matter continues to be above the levels recommended by the World Health Organization (10 µg/m^3 annual mean). Emissions from fuel combustion in households and from commercial and institutional buildings are the main source of air pollution from $PM_{2.5}$ in the EU, accounting for 57 % of total primary $PM_{2.5}$ emissions ([12]). However, a significant proportion of total particulate matter can also form in the atmosphere from other gaseous pollutants, such as nitrogen oxides and ammonia.

14.5 µg/m^3
Average concentration of fine particulate matter in 2015

According to recent European Environment Agency estimates, 7 % of the EU urban population were exposed to levels above the EU $PM_{2.5}$ limit value in 2015. If the more stringent WHO air quality guideline is considered, about 82 % of people living in cities were estimated to be exposed to $PM_{2.5}$ concentration levels deemed harmful by the WHO ([13]). In most cities around the world, polluted air is a major health hazard, with only 10 % of the world's population living in areas that meet the annual WHO air quality guideline value for particulate matter in 2014 ([14]). According to EEA estimates, exposure to $PM_{2.5}$ was responsible for about 399 000 premature deaths in the EU in 2014 ([15]), which is 15 times more deaths than from traffic road accidents in that year.

Degree of urbanisation has only marginal influence on overcrowding but strongly affects perception of noise pollution, crime and vandalism

The prevalence of overcrowding in the EU did not differ strongly between cities (17.6 %) and rural areas (17.1 %) in 2016, despite rural dwellings tending to be larger ([16]). One possible explanation for this is that households in rural areas also tend to be larger ([17]). The EU population living in towns and suburbs experienced the lowest overcrowding rate (14.8 %). However, while the overcrowding rate for cities was relatively stable around 18.0 % between 2011 and 2016, households in towns and suburbs have become more overcrowded, with the rate rising by 3.5 percentage points during this period. Households in rural areas have become less overcrowded (– 4.6 percentage points) over the same time span ([18]).

However, the degree of urbanisation strongly affects the perceived level of noise pollution. In 2016, people living in EU cities were more likely to report noise from neighbours or from the street (23.3 %) compared to those living in towns and suburbs (17.6 %) or in rural areas (10.4 %) ([19]). Similarly, the perceived occurrence of crime and vandalism in cities (19.1 %) was almost three times higher than in rural areas (6.6 %), and also above the level observed in towns and suburbs (10.8 %) ([20]).

19.1 %
of people living in EU cities reported occurrence of crime and vandalism in their area in 2016

Income is an important determinant of quality of living space

The prevalence of poor housing, overcrowding, exposure to noise and perception of crime and violence in the EU was higher for the population living below 60 % of the median equivalised income (the level where people are at risk of poverty) compared to the population above this level. The gap was particularly wide for overcrowding, where people below the poverty threshold were over two times more likely to live in overcrowded conditions (29.5 % in 2016) than people above (13.9 %). The difference in perceived exposure to noise pollution between income groups was highest in cities (6.8 percentage points) and almost negligible in rural areas (0.3 percentage points). The perception of crime and vandalism shows similar differences between income groups, being highest in cities (6.1 percentage points) and lowest (1.2 percentage points) in rural areas.

Sustainable transport

A functioning transport system is required for people to reach their places of work, education, services and social activities, all of which affect the quality of life. Not only the availability but also the type, quality and safety of transport systems are crucial when designing sustainable and inclusive cities and communities.

Cars are the main means of transport in the EU

The EU aims to improve citizens' quality of life and to strengthen the economy by promoting sustainable urban mobility and the increased use of clean and energy-efficient vehicles. The challenge of enhancing mobility, while at the same time reducing congestion, accidents and pollution, is common to all major cities ([21]). Public transport networks help to relieve traffic jams, reduce harmful pollution and offer more affordable ways to commute to work, to access services and to travel for leisure. Furthermore, they can stimulate economic growth and social inclusion through improved accessibility and mobility for all.

17.1 %
of total inland passenger-km were covered by buses and trains in 2016

Since 2000, the share of buses and trains in total passenger transport has stagnated well below 20 %, accounting for only 17.1 % in 2016. Although this share has increased slightly by 0.3 percentage points since 2011, the long-term trend since 2001 shows these collective modes are losing shares (– 0.2 percentage points) in favour of passenger cars. This means most passenger journeys in the EU are still undertaken by car. A noticeable shift towards more sustainable collective transport modes has thus not taken place in the past 15 years in the EU.

To encourage a modal shift towards collective transport modes, easy accessibility of public transport is a prerequisite. However, data collected in 2012 show that one in five Europeans (20.4 %) reported 'high' or 'very high' levels of difficulty in accessing public transport, indicating that convenient public transport is not universally accessible to EU citizens. Disadvantaged groups such as the elderly, those at risk of poverty and those with disabilities are likely to be the most affected by barriers to accessing public transport. Access is also particularly important for people with low incomes because they are less likely to afford a car.

The EU has established guidelines for sustainable urban mobility planning and provides funding for related projects, including through the use of the European Regional Development Fund.

People living in rural areas had the most difficulty accessing public transport in the EU

People living in cities had easier access to public transport, with only 9.7 % reporting high or very high levels of difficulty, compared

to 37.4 % of those living in rural areas. The availability of public transport depends on infrastructure investment and on the demand for such services, which, among other factors, is determined by residential density and the spatial organisation of urban activities. In this context, remote and rural areas can face particular challenges in providing good access to public transport because of the distribution of dwellings across large areas, low density of potential passengers and often unpredictable level of demand.

20.4 %
of the EU population had (very) difficult access to public transport in 2012

Despite good progress since 2001, stagnation in the level of road fatalities in recent years has pushed the EU off track to meeting its 2020 target

Since most passenger journeys in the EU are undertaken by car, road safety is an important factor for human health and well-being. In 2014, 1.7 % of the EU population reported a road accident resulting in injuries ([22]), and it is estimated that around 135 000 people are also seriously injured each year ([23]). In 2016, about 70 people lost their lives on EU roads every day. This equalled 25 651 people for the entire year — a loss equivalent to the size of a medium town. However, the EU has made considerable progress in this respect, by decreasing road casualties by 53 % in the past 15 years. National regulations applying to vehicles and drivers along with improvements to road infrastructure have largely contributed to this trend. However, the stagnation in road fatalities since 2013 has pushed the EU off its path to reaching its ambitious 2020 target of halving the total death toll on EU roads compared to 2010.

25 651
people were killed in road accidents in the EU in 2016

The incidence of road traffic fatalities was highest on non-motorway roads outside urban areas (54.3 %), followed by roads inside urban areas (36.8 %) in 2015 ([24]).

In 2010 the Commission adopted the Communication 'Towards a European road safety area: policy orientations on road safety 2011–2020', setting the target of halving the overall number of road deaths in the EU by 2020 compared to 2010 and outlining 16 proposed actions divided under seven focus areas. Several policy measures have been put in place that aim to make users, vehicles and infrastructure safer. In May 2018, the Commission published a new Communication outlining the road safety policy framework for the period 2020 to 2030, accompanied by two legislative initiatives on vehicle and pedestrian safety and on infrastructure safety management.

Men, young people and the elderly are overrepresented in road casualties

Men, especially in the age group 20 to 24 years are more likely to be involved in accidents resulting in injuries, with 3.6 % of male EU population in comparison to 2.7 % of females of the same age group in 2014 ([25]). In general, young people and the elderly face the highest risk of traffic accidents. Although these age groups did not account for the majority of road deaths in 2016, people aged between 15 and 24 years and 65 years or over were overrepresented in road casualties, making up 11 % and 19 % of the population but 15 % and 27 % of all road fatalities, respectively ([26]). However, fatalities among young road users have been falling in contrast to a growing share of the elderly in road deaths. Car drivers were the main victims of road accidents (62 %), followed by pedestrians (21 %) and passengers (17 %) ([27]).

Adverse environmental impacts

While cities and communities serve as a focal point for social and economic activity, if not managed sustainably, they risk causing considerable environmental damage. At the same time, large and densely populated cities provide opportunities for achieving economies of scale in the provision of ecologically relevant services. EU progress in this area is monitored by four indicators looking into management of municipal waste, wastewater treatment, air quality and artificial land cover.

More environmentally friendly modes of municipal waste management in the EU

Waste management activities promote recycling, which not only reduces the amount of waste going to landfills and the associated environmental impacts but also leads to higher resource efficiency. Recycling also helps create jobs while reducing the demand for raw materials.

The 'waste hierarchy' is an overarching logic guiding EU policy on waste, which prioritises waste prevention, followed by re-use, recycling, other recovery and finally disposal, including landfilling, as the last resort. Although municipal waste accounts for only 10 % of total waste generated in the EU, it is highly visible and closely linked to consumption patterns. Its prevention has the potential to reduce the adverse environmental impact of cities and communities not only during the consumption and the waste phases but also throughout the whole life cycle of the products consumed ([28]).

Sustainable urban development is a horizontal objective of the 7th Environment Action Programme (EAP). The Circular Economy Package supports the transition to a stronger and more circular economy where resources are used in a more sustainable way. The European Green Capital and the European Green Leaf initiatives showcase the EU's commitment to resolving urban environmental challenges. In May 2018 the European Council established legally binding targets for recycling and reuse of municipal waste.

45.3 %
of total municipal waste generated in the EU was recycled in 2016

In 2016, each EU citizen generated on average 1.3 kilograms of municipal waste per day, which was just 0.1 kg below the 2000 figure. Although the EU has not substantially reduced its municipal waste generation in the past 15 years, it has clearly shifted to more sustainable modes of managing a large bulk of it. Since 2007, the recycling rate has been increasing continuously, by 10.3 percentage points in total. In 2016, almost half (45.3 %) of the municipal waste generated in the EU was recycled. EU and national strategies prioritising efficient waste management through various instruments have largely contributed to this movement up the 'waste hierarchy'.

Connection rates to wastewater treatment are increasing

Cities and communities also place significant pressure on the water environment through waste water from households and industry which contains organic matter, nutrients and hazardous substances. Over the period 2013 to 2015, 14 Member States reported that more than 80 % of the population were connected to at least secondary wastewater treatment plants, which use aerobic or anaerobic micro-organisms to decompose most of the organic material and retain some of the nutrients. In five Member States, more than 90 % of the population were connected to such services. The shares increased in all Member States between 2000 and 2015, with

14
Member States reported connection rates to at least secondary wastewater treatment of more than 80 % of their population in 2015

the highest connection rates generally observed in the 'old' (EU-15) Member States. However, it may not be suitable to connect 100 % of the population to a sewerage collection system, either because it would produce no environmental benefit or would be too costly. In these cases, individual solutions or other appropriate systems that achieve the same level of environmental protection should be used. For example, in countries such as those in Scandinavia or the Alpine region, where settlements are small and scattered, secondary treatment may not be required ([29]).

Artificial land cover per capita has increased and the rate of land take has accelerated

Urbanisation and infrastructure development also pose a risk to natural ecosystems if they are not managed sustainably. At the same time, compact cities can provide a resource-efficient and environmentally sustainable way for people to live and businesses to exist. In this context, the concentration of built-up and non-built up urban infrastructure can also reduce land take. Despite EU efforts to increase land use efficiency, artificial land cover per capita has increased by 6 % since 2009. In 2015, 367.2 m^2 of land for each EU inhabitant were covered by artificial surfaces, some 20 m^2 more than six years earlier. As Europe is one of the most urbanised continents in the world, this trend does not place the EU on track to halting land degradation. According to the European Environment Agency, land take for the expansion of residential areas and construction sites comes at the expense of agricultural zones and, to a lesser extent, forests and semi-natural and natural areas. This affects biodiversity since it decreases habitats and fragments the landscapes that support and connect them ([30]).

367.2

square metres of land were covered by artificial surfaces per capita in 2015

Presentation of the main indicators

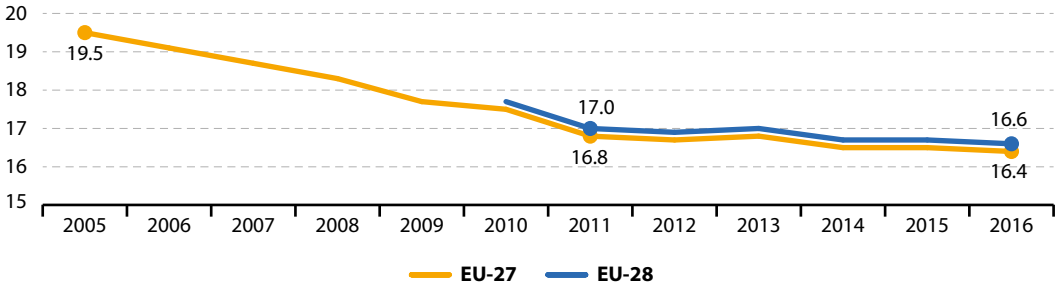
LONG TERM 2005–2016

SHORT TERM 2011–2016

Overcrowding rate

This indicator measures the share of people living in overcrowded conditions in the EU. A person is considered to be living in an overcrowded household if the house does not have at least one room for the entire household as well as a room for a couple, for each single person above 18, for a pair of teenagers (12 to 17 years of age) of the same sex, for each teenager of different sex and for a pair of children (under 12 years of age). The data stem from the EU Statistics on Income and Living Conditions (EU-SILC).

Figure 11.1: Overcrowding rate, EU-27 and EU-28, 2005–2016
(% of population)

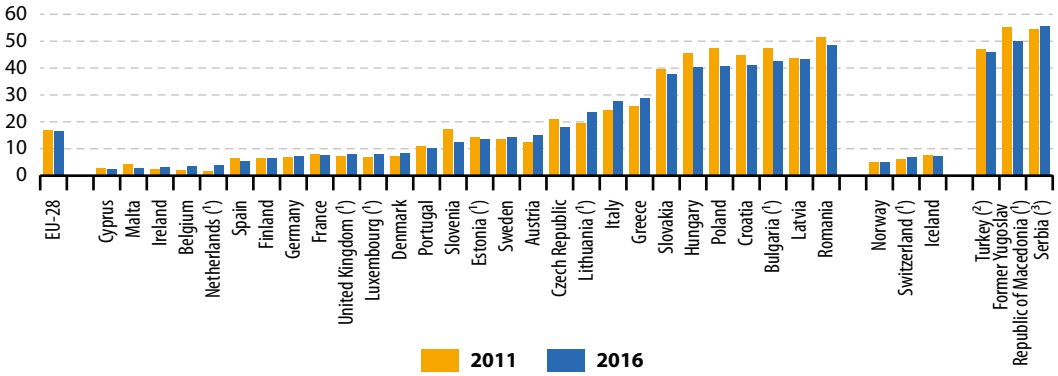


Note: 2005–2006 data are estimates.

Source: Eurostat (online data code: sdg_11_10)

As shown in Figure 11.1, fewer and fewer people in the EU are living in overcrowded conditions. Between 2005 and 2016, the overcrowding rate fell by 1.6 % on average per year (EU-27). Progress has slowed in the short-term, with an annual average decrease of 0.5 % between 2011 and 2016.

Figure 11.2: Overcrowding rate, by country, 2011 and 2016
(% of population)



(1) Break(s) in time series between 2011 and 2016. (2) 2015 data (instead of 2016). (3) 2013 data (instead of 2011).

Source: Eurostat (online data code: sdg_11_10)

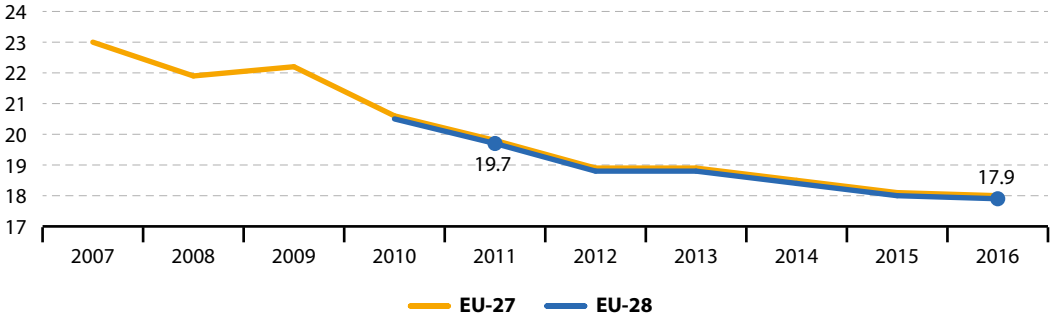
Population living in households considering that they suffer from noise

LONG TERM
Insufficient data to calculate trend

SHORT TERM
2011–2016

This indicator measures the proportion of the population who declare they are affected either by noise from neighbours or from the street. Because the assessment of noise pollution is subjective, an increase in the value of the indicator may not necessarily indicate a similar increase in noise pollution levels but also a decrease in the levels that European citizens are willing to tolerate and vice versa. The data stem from the EU Statistics on Income and Living Conditions (EU-SILC).

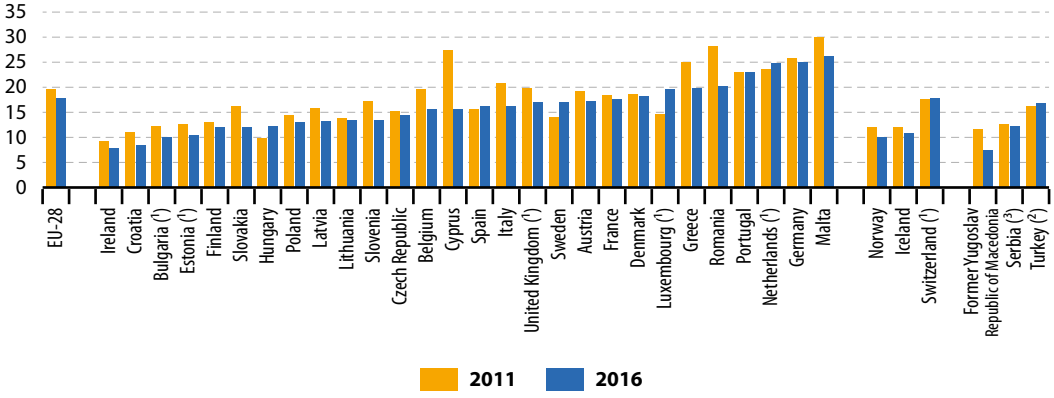
Figure 11.3: Population living in households considering that they suffer from noise, EU-27 and EU-28, 2007–2016
(% of population)



Source: Eurostat (online data code: sdg_11_20)

Figure 11.3 shows that the proportion of the EU population considering that they suffer from noise from neighbours or from the street declined by 1.9 % on average per year between 2011 and 2016.

Figure 11.4: Population living in households considering that they suffer from noise, by country, 2011 and 2016
(% of population)



(1) Break(s) in time series between 2011 and 2016. (2) 2015 data (instead of 2016). (3) 2013 data (instead of 2011).

Source: Eurostat (online data code: sdg_11_20)

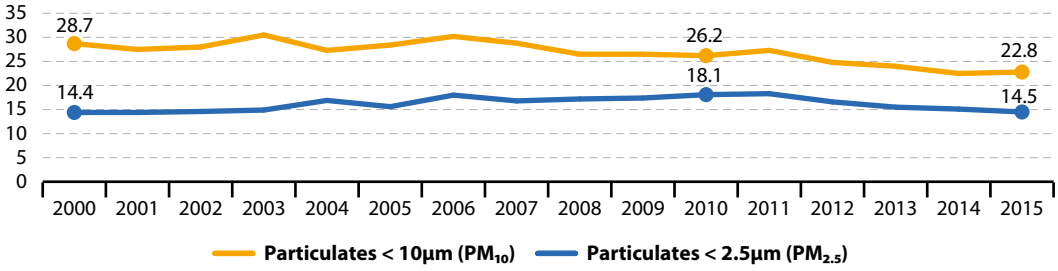
LONG TERM 2000–2015

SHORT TERM 2010–2015

Exposure to air pollution by particulate matter

The indicator measures the population weighted annual mean concentration of particulate matter at urban background stations in agglomerations. Fine and coarse particulates (PM_{10}) are less than 10 micrometers in diameter and can be carried deep into the lungs where they can cause inflammation and exacerbate the condition of people suffering from heart and lung diseases. Fine particulates ($PM_{2.5}$) are less than 2.5 micrometers in diameter and are therefore a subset of the PM_{10} particles. Their negative health impacts are more serious than PM_{10} because they can be drawn further into the lungs and may be more toxic. Based on the annual submissions of Member States' measured concentrations, the data are processed by the European Environment Agency (EEA), assisted by the Topic Centre on Air Pollution and Climate Change Mitigation (ETC/ACM).

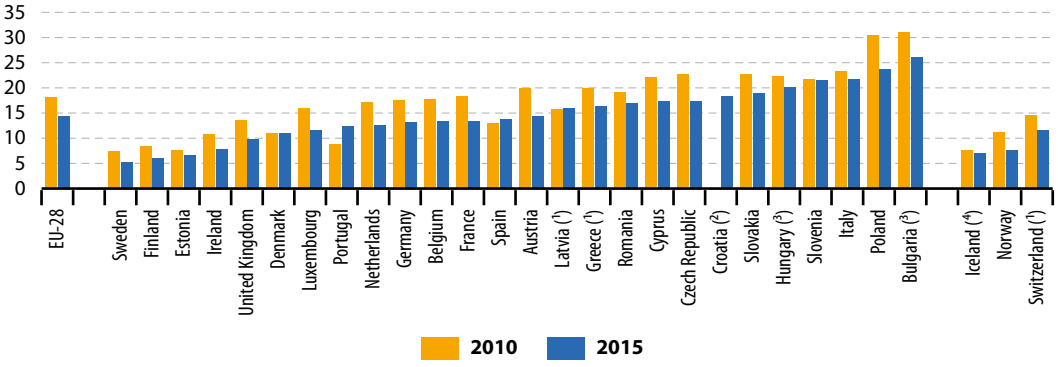
Figure 11.5: Exposure to air pollution by particulate matter, EU-28, 2000–2015
(µg/m³)



Source: European Environment Agency, Eurostat (online data code: sdg_11_50)

As shown in Figure 11.5, air quality in the EU in terms of the more dangerous fine particulates ($PM_{2.5}$) has not improved over the past 15 years. The concentration of $PM_{2.5}$ increased between 2000 and 2015 by 0.05 % on average per year. In the short term the concentration declined annually by 4.3 % on average.

Figure 11.6: Exposure to air pollution by particulate matter ($PM_{2.5}$), by country, 2010 and 2015
(µg/m³)



(1) 2009 data (instead of 2010). (2) No data for 2010. (3) 2014 data (instead of 2015). (4) 2013 data (instead of 2015).

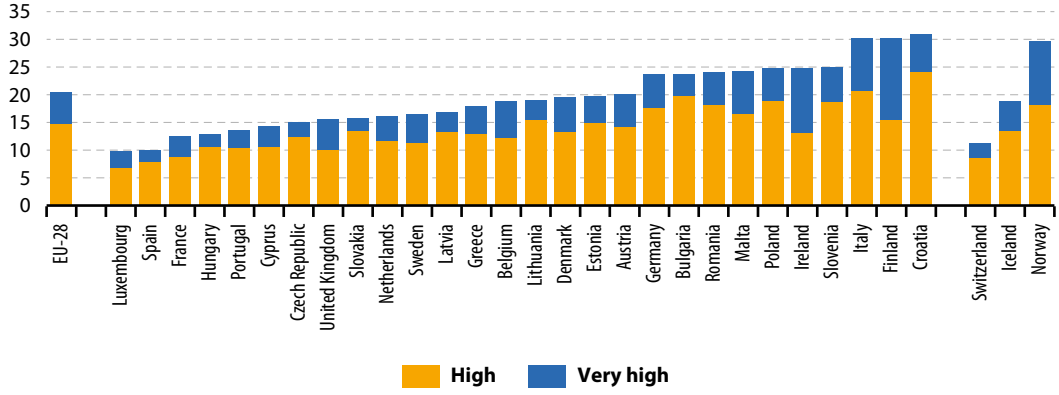
Source: European Environment Agency, Eurostat (online data code: sdg_11_50)

Difficulty in accessing public transport

X Insufficient data to calculate trends

The indicator measures the share of population reporting high or very high level of difficulty in accessing public transport. The data stem from the EU Statistics on Income and Living Conditions (EU-SILC). No time series can be presented as EU-SILC data on difficulty in access to public transport were collected in 2012 only.

Figure 11.7: Difficulty in accessing public transport by level of difficulty, by country, 2012
(% of population)



Source: Eurostat (online data code: sdg_11_30)

Across EU countries, the share of the population reporting very high or high difficulty in gaining access to public transport in 2012 ranged from 9.8 % to 30.8 %, with an EU average of 20.4 %. Among other factors, country variations tend to reflect differences in population density, investment in transport infrastructure and urban sprawl.

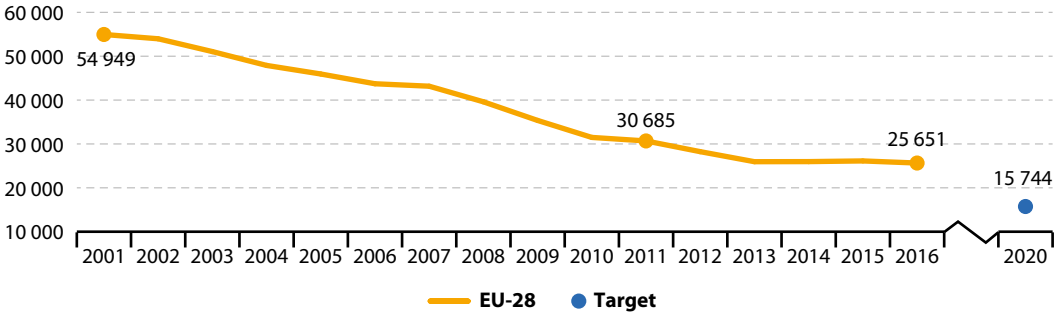
LONG TERM 2001–2016

SHORT TERM 2011–2016

People killed in road accidents

This indicator measures the number of fatalities caused by road accidents, including drivers and passengers of motorised vehicles and pedal cycles as well as pedestrians. People who die from injuries up to 30 days after being involved in a road accident are counted as road accident fatalities. After these 30 days, a different cause of death may be declared. For Member States not using this definition, corrective factors were applied. The data come from the CARE database managed by DG Mobility and Transport (DG MOVE).

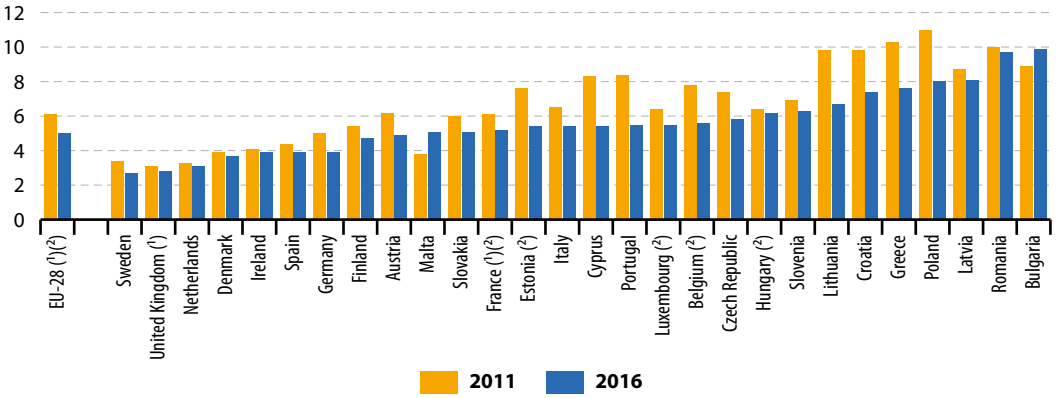
Figure 11.8: People killed in road accidents, EU-28, 2001–2016
(number of killed people)



Source: European Commission services, DG Mobility and Transport (online data code: sdg_11_40)

As shown in Figure 11.6, the progress made in reducing the number of people killed in road accidents has slowed in recent years. While in the long term, since 2001, the number has declined annually by 5.0 % on average, deaths due to road accidents have only fallen by 3.5 % on average per year since 2011. The stagnation in road casualties since 2013 has pushed the EU off track from its target of halving the number of road fatalities by 2020 compared to 2010 levels.

Figure 11.9: People killed in road accidents, by country, 2011 and 2016
(rate)



(1) 2016 data are provisional and/or estimates. (2) Break(s) in time series between 2011 and 2016.

Source: European Commission services, DG Mobility and Transport (online data code: sdg_11_40)

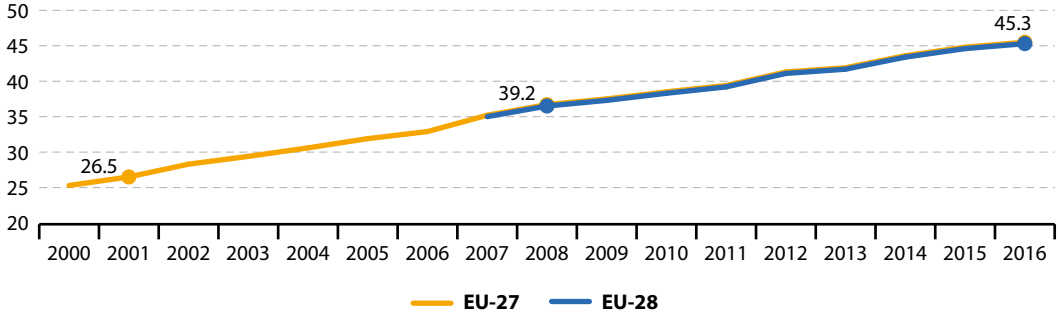
Recycling rate of municipal waste

LONG TERM 2001–2016

SHORT TERM 2011–2016

This indicator measures the amount of municipal waste recycled divided by the total municipal waste. Recycling includes material recycling, composting and anaerobic digestion. Municipal waste consists mostly of waste generated by households, but may also include similar wastes generated by small businesses and public institutions and collected by the municipality. This latter part of municipal waste may vary from municipality to municipality and from country to country, depending on the local waste management system. For areas not covered by a municipal waste collection scheme, the amount of waste generated is estimated. Member States report the amount of waste recycled and the total municipal waste generated each year to Eurostat.

Figure 11.10: Recycling rate of municipal waste, EU-27 and EU-28, 2000–2016
(% of total waste generated)

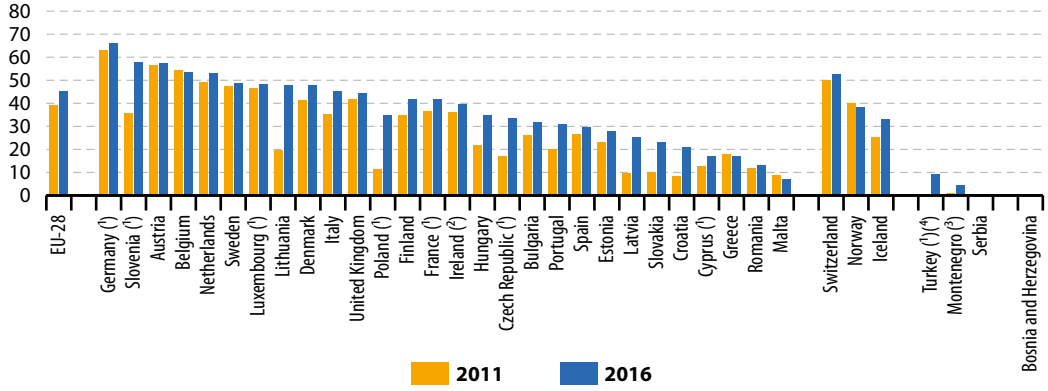


Note: Eurostat estimates.

Source: Eurostat (online data code: sdg_11_60)

As shown in Figure 11.10, recycling of municipal waste in the EU has increased strongly. The recycling rate of municipal waste has increased by 3.7 % per year on average over the long term and by 2.9 % on average in the short term.

Figure 11.11: Recycling rate of municipal waste, by country, 2011 and 2016
(% of total waste generated)



(1) Estimated data. (2) 2014 data (instead of 2016). (3) 2015 data (instead of 2016). (4) No data for 2011.

Source: Eurostat (online data code: sdg_11_60)

Further reading on sustainable cities and communities

European Environment Agency (2017), *Air quality in Europe — 2017 report, EEA report No 13/2017*, Luxembourg, Publications Office of the European Union.

European Environment Agency (2016), *Urban sprawl in Europe - joint EEA-FOEN report*, Luxembourg, Publications Office of the European Union.

European Commission (2016), *State of European Cities 2016*, Luxembourg, Publications Office of the European Union.

European Commission (2015), *Road Safety in the European Union: Trends, statistics and main challenges*, Brussels.

European Commission (2015), *Regional Working Paper 2015: Measuring access to public transport in European cities*.

Eurostat (2017), *Eurostat regional yearbook 2017*, Luxembourg, Publications Office of the European Union.

Eurostat (2016), Urban Europe: Statistics on cities, towns and suburbs, Luxembourg, Publications Office of the European Union.

The Housing Europe Observatory (2017), *The State of Housing in the EU 2017*, Brussels, Housing Europe, the European Federation for Public, Cooperative and Social Housing.

United Nations, Department of Economic and Social Affairs, Population Division (2016), *The World's Cities in 2016 — Data Booklet* (ST/ESA/ SER.A/392).

WHO (2015), *Global Status Report on Road Safety 2015.*

Further data sources on sustainable cities and communities

European Environment Agency, Population exposure to environmental noise.

European Commission, Mobility and Transport. Statistics — accidents data.

European Environment Agency, Waste recycling.

European Environment Agency, Land take.

Notes

(1) 2016 data. Source: Eurostat (online data code: ilc_lvho01).
(2) Eurostat (2016), *Urban Europe: Statistics on cities, towns and suburbs*, Luxembourg, Publications Office of the European Union, p. 9.
(3) Degree of urbanisation classifies local administrative units as 'cities', 'towns and suburbs', or 'rural areas'. In 'cities' at least 50 % of the population lives in an urban centre. If less than 50 % lives in an urban centre but more than 50 % of the population lives in an urban cluster it is classified as 'towns and suburbs', and if more than 50 % of the population lives outside an urban cluster it is a 'rural area'.
An urban centre is a cluster of contiguous grid cells of 1 km^2 with a density of at least 1 500 inhabitants per km^2 and a minimum population of 50 000 people. An urban cluster is a cluster of contiguous grid cells of 1 km^2 with a density of at least 300 inhabitants per km^2 and a minimum population of 5 000 people.
(4) 2007 data refer to the EU-27.
(5) 2005 data refers to the EU-27 and are estimates.
(6) 2007 data refers to the EU-27.
(7) European Commission, Environment: Noise.
(8) L_{den} is an indicator of the overall noise level during the day, evening and night, which is used to convey the annoyance caused by noise exposure. The Environmental Noise Directive defines an L_{den} threshold of 55 dB.
(9) European Environment Agency (2017), *Managing exposure to noise in Europe*.
(10) World Health Organization (2016), *World Health Statistics 2016: Monitoring Health for the SDGs*, p. 37.
(11) For $PM_{2.5}$, the Ambient Air Quality Directive 2008/50/EC introduced a target value to be attained by 2010, which became a limit value starting in 2015. For more information on EU air quality standards see: http://ec.europa.eu/environment/air/quality/standards.htm
(12) European Environment Agency (2017), *Air Quality in Europe 2017 Report*, p. 22.
(13) Id., p. 8.
(14) United Nations (2017), *The Sustainable Development Goals Report 2017*, p. 41.
(15) European Environment Agency (2017), Air Quality in Europe 2017 Report, p. 58.
(16) See: Average size of dwelling by household type and degree of urbanisation. Source: Eurostat (online data ode: ilc_hcmh02).
(17) For instance, see Households characteristics by degree of urbanisation. Source: Eurostat (online data code: hbs_car_t315).
(18) Source: Eurostat (online data code: ilc_lvho05d).
(19) Source: Eurostat (online data code: ilc_mddw04).
(20) Source: Eurostat (online data code: ilc_mddw06).
(21) European Commission (2013), *Together towards competitive and resource-efficient urban mobility*, COM(2013) 913 final, p. 1.
(22) Source: Eurostat (online data code: hlth_ehis_ac1e)
(23) European Transport Safety Council (2017), press release, *Transport ministers call for target to reduce serious road injuries.*
(24) European Commission (2017), Annual Accidents Report, p.74.
(25) Source: Eurostat (online data code: hlth_ehis_ac1e)
(26) Source: Eurostat (online data code: tran_sf_roadag and demo_pjanind).
(27) Own calculations based on European Commission, Mobility and Transport. Statistics — accidents data.
(28) European Environment Agency (2016), *Municipal waste management across European countries*. Briefing.
(29) European Commission, (2016), *Eighth Report on the Implementation Status and the Programmes for Implementation (as required by Article 17) of Council Directive 91/271/EEC concerning urban waste water treatment*, p. 4
(30) European Environment Agency (2017), Land take.

12 Ensure sustainable consumption and production patterns

Goal 12 calls for a comprehensive set of actions from businesses, policy-makers, researchers and consumers to adapt to sustainable practices. It envisions sustainable production and consumption based on advanced technological capacity, resource efficiency and reduced global waste.

eurostat supports the SDGs

Consumption and production patterns have wide environmental impacts. Sustainable production and consumption patterns use resources efficiently, respect resource constraints and reduce pressures on natural capital in order to increase overall well-being, keep the environment clean and healthy, and safeguard the needs of future generations. The rise in living standards and the quality of life in Europe since the end of World War II has been made possible through increases in income, production and consumption, which so far have gone hand in hand with more resource extraction and growing pressures on natural capital (air, water, land and biodiversity) and climate. Since we live on a planet with finite and interconnected resources, the rate at which they are used has relevant implications for today's prosperity and lasting effects on future generations. It is thus important for the EU to decouple economic growth and improvement of living standards from resource use and the eventual negative environmental impacts. This involves increasing the circularity of materials in the economy, thereby reducing both the need for resource extraction and the amount of waste ending up in landfills or incineration. It

also means safe management of chemicals and shifting from carbon-intensive energy carriers towards sustainably produced renewable energy sources. Such an approach would not only reduce environmental pressures, but also provide major economic benefits.

Table 12.1: Indicators measuring progress towards SDG 12, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Decoupling environmental impacts from economic growth			
Consumption of toxic chemicals	↗ (1)	↗	page 226
Resource productivity	↑	↑	page 227
Average CO_2 emissions per km from new passenger cars	↗ (2)	↗	page 229
Energy productivity (*)	↑	↑	SDG 7, page 143
Energy consumption			
Energy consumption (*) – Primary energy consumption	↗	↗	SDG 7, page 140
Energy consumption (*) – Final energy consumption	↗	↘	
Share of renewable energy in gross final energy consumption (*)	↑ (1)	↑	SDG 7, page 144
Waste generation and management			
Circular material use rate	↑ (2)	↑	page 230
Generation of waste excluding major mineral wastes	↑ (2)	↗ (3)	page 231
Recycling rate of waste excluding major mineral waste	:	↗ (3)	page 232

(*) Multi-purpose indicator.
(1) Past 12-year period.
(2) Past 10-year period.
(3) Past 4-year period.

Table 12.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Responsible consumption and production in the EU: overview and key trends

Monitoring SDG 12 in an EU context focuses on developments in the areas of decoupling environmental impacts from economic growth, energy consumption, and waste generation and management. As Table 12.1 shows, the EU has made significant progress in virtually all three areas of consumption and production analysed in this chapter. However, progress in reducing energy consumption has slowed down over the past few years.

Decoupling environmental impacts from economic growth

Increases in economic activity have long been associated with growing resource and energy consumption. To allow for a continued improvement of living standards and quality of life without sacrificing the natural resource base they depend on, the EU strives to become a resource-efficient, green, and competitive low-carbon economy ([1]). Focus has therefore shifted to improving the efficiency of resource and energy use by restructuring economies towards producing more from the same resource and energy input. This is of particular relevance in view of a growing population and rising per-capita wealth, which may result in more overall resource consumption, despite an increase in resource efficiency. Such decoupling of economic growth from the consumption of natural resources should also go along with minimising harmful impacts on human health and the environment.

2.04
EUR of GDP were produced in the EU for each kilogram of DMC used in 2017

The EU's progress in this area is monitored by four indicators. Two of them look at the ratio of resource use (materials and energy) to GDP, while the other two look at the harmful environmental impacts of consumption of toxic chemicals and emissions related to transport. Overall, these indicators show some progress over the past few years: the EU's resource and energy productivity has risen, while consumption of hazardous chemicals has decreased and CO_2 emissions from new cars have remained stable.

Productivity of resources and energy has increased considerably over the past 15 years

Resource productivity ([2]) and energy productivity ([3]) directly monitor how much output (in terms of GDP) an economy produces per unit of used materials or energy. Over the past 15 years, the EU has increased its resource productivity by 32.9 % (referring to the period 2002 to 2017), reaching EUR 2.04 per kg in 2017, and its energy productivity by 29.2 % (2001 to 2016), reaching EUR 8.4 per kgoe in 2016. These trends can be attributed to the growth of the EU economy, alongside reductions in domestic material consumption (DMC) and gross inland energy consumption (GIC). The EU economy grew (in terms of GDP) by 21.2 % and by 22.4 % over the periods 2001 to 2016 and 2002 to 2017, respectively ([4]). Over the same time spans, GIC fell by 7.2 % (from 2001 to 2016) ([5]) and DMC fell by 7.8 % (from 2002 to 2017).

In 2016, the EU's energy productivity (GDP per unit of GIC) amounted to

8.4
EUR per kgoe

The observed trends, however, need to be interpreted with caution, as they might not be entirely due to the success of environmental policies. It is very likely that the drop in DMC from 2008 onwards was strongly influenced by the economic crisis ([6]): following the onset of the crisis, the use of materials declined rapidly. In 2017, total DMC was 16.8 % lower than in 2007, the year before the start of the economic crisis. This development was mostly caused by the rapid slowdown in

construction activities, which account for the lion's share of total material use but contribute, in relative terms, much less to the EU economy ([7]). Other economic or technical factors might also have affected the positive trend in resource productivity, including the long-term shift of the EU towards a service economy, globalisation, an increasing reliance on imports, and even the nature of the indicator itself ([8]). The latter refers to the fact that DMC does not include 'hidden' raw material flows, which are required to generate imports or exports but are not part of the imported and exported raw materials and products ([9]).

The consumed materials can be classified into two types: renewable materials, such as biomass, and non-renewable materials, such as fossil fuels, metals and non-metallic minerals. Non-metallic minerals (for example, marble, granite, sand, salt) is the largest category of minerals, with a share of 47.7 % in total DMC in 2017. They are mainly used for building infrastructure such as roads, homes, schools and hospitals, and for producing many industrial and consumer products such as cars, computers, medicines and household appliances. Biomass is the second largest category (24.9 % in 2017), followed by fossil energy materials/carriers (22.3 %) and metal ores (4.9 %) ([10]).

Consumption of non-metallic minerals decreased by 8.4 % over the long-term period (2002 to 2017), but has increased by 4.6 % in the short-term period since 2012. In contrast, consumption of fossil energy materials (including coal, natural gas and oil) has fallen both in the long- and short-term periods, with an especially noteworthy 18.5 % decrease between 2002 and 2017. This decline might have been driven in part by a decrease in overall economic activity from 2008 onwards due to the economic crisis, but also by a long-term trend of increased use of energy from renewable sources, as well as the improved overall energy efficiency of the EU economies ([11]). The consumption of biomass has increased by 3.2 % in the short term (since 2012), while it has remained nearly unchanged in the long term (since 2002). Only the consumption of metal ores increased significantly in both the short and the long term, by 25.5 % and 17.0 %, respectively.

Consumption of toxic chemicals fell moderately in the long and short term

Most everyday products used by businesses and consumers are produced with the help of chemicals. Chemicals are one way for farmers to protect their crops from pests, and they are used as ingredients in pharmaceuticals, detergents, cosmetics, textiles, buildings and other artificial areas, as well as packaging. These uses make them a significant contributor to the EU economy, with sales worth EUR 507 billion in 2016 ([12]). The consumption of chemicals provides benefits to society, but can also entail risks to the environment and human health. Risk depends on both the hazard presented by the chemicals and the exposure to them. Tracking the consumption volumes of industrial chemicals that are hazardous

The 7th Environment Action Programme ([13]), the agreed framework for EU environment policy until 2020, has put forward three key objectives: (a) to protect, conserve and enhance the Union's natural capital; (b) to turn the Union into a resource-efficient, green and competitive low-carbon economy, with a special focus on converting waste into a resource; and (c) to safeguard the Union's citizens from environment-related pressures and risks to health and well-being while maintaining a long-term vision of a non-toxic environment. Four so-called enablers help Europe deliver on these goals: better implementation of legislation, better information by improving the knowledge base, more and wiser investment for environment and climate policy, and full integration of environmental requirements and considerations into other policies. Two additional horizontal priority objectives complete the programme: to make the Union's cities more sustainable and to help the Union address international environmental and climate challenges more effectively.

The REACH framework ([14]) aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances while enhancing the competitiveness of the EU chemicals industry.

To reduce the impact from the use of toxic chemicals on humans and the environment, the 7th EAP has announced an EU strategy for a non-toxic environment. A number of studies and evaluations were commissioned to provide a comprehensive basis for continued strategic work on sustainable chemicals management. A report bringing together findings and conclusions from these processes is expected in 2019.

The European Chemical Agency's substitution strategy, adopted in 2018, aims to encourage the replacement of harmful chemicals by boosting the availability and adoption of safer alternatives and technologies. It highlights networking, capacity building and improving access to data, funding and technical support as key areas for action.

to human and environmental health is, therefore, used as an imperfect proxy for human exposure ([15]).

In 2016, 344.7 million tonnes of chemicals were consumed in the EU. Of this volume, 35.4 % (122.0 million tonnes) were classified as hazardous to the environment and 62.2 % (214.5 million tonnes) as substances that might harm human health. Since 2004, the consumption has declined by 10.5 % for chemicals hazardous to the environment and by 10.7 % for chemicals hazardous to health.

214.5
million tonnes of chemicals hazardous to health were consumed in the EU in 2016

However, a reduction in the consumption of toxic chemicals cannot be equated to a reduction in the risks. For instance, it is possible that reductions in the consumption of toxic chemicals are being offset by increased imports of products that contain such chemicals. Production of chemicals in the EU, which are not consumed but exported, can pollute at the location where they are produced. Likewise, chemicals that are made and used outside the EU can reach Europe via air, water and food, as well as in products ([16]). It should also be noted that the actual risks related to the use of toxic chemicals is not necessarily associated with the amount of consumption, as some chemicals are handled in closed systems while others can be formed during use (for example, polycyclic aromatic hydrocarbons) with high-risk management measures, or as intermediate goods in controlled supply chains ([17]).

The decline in average CO_2 emissions per km for newly registered passenger cars has slowed down in recent years

Cars are responsible for around 12 % of total EU emissions of carbon dioxide (CO_2), the main greenhouse gas ([18]). To reduce the negative impact of passenger cars on the environment, the EU has set mandatory emission reduction targets for new vehicles of 130 grams of CO_2 per kilometre in 2015 and 95 grams of CO_2 per kilometre in 2021 ([19]). These targets apply to manufacturers' new car fleets. For each manufacturer, a specific emission target is set according to the average mass of its new vehicles, using a limit value curve ([20]). The curve is set in such a way that the targets for the EU fleet average emissions are achieved.

118.5
grams of CO_2 per km were emitted by new passenger cars in the EU in 2017

While the passenger car fleet in almost all Member States has grown over the past decade ([21]), average CO_2 emissions per km from new passenger cars in the EU have fallen by 10.4 % since 2012, reaching 118.5 grams of CO_2 per km in 2017. While the 2015 target has been met two years in advance, a recent slowdown in emission

reductions observed since 2015 means further progress will be necessary to reach the 2021 target set at 95 grams of CO_2 per km.

It should also be noted that the effective reduction in emission intensity, measured in CO_2 emissions per km, appears to be lower than indicated by official type-approved values used for monitoring purposes. Under real-world driving conditions, new passenger cars in the EU emitted in 2015 on average around 40 % more than in the laboratory ([22]). Until 2017, the New European Driving Cycle (NEDC) test procedure had been used to measure CO_2 emissions of new passenger cars. Yet, the outdated NEDC no longer corresponds to present-day driving conditions or vehicle technologies. This allowed carmakers to optimise the testing, thereby achieving lower fuel consumption and CO_2 emission values, for example by optimising vehicle temperature during the testing, resulting in a lower rolling resistance ([23]). In recognition of these shortcomings, in September 2017 the EU introduced a new measurement procedure known as the Worldwide Harmonised Light Vehicles Test Procedure (WLTP). The WLTP provides stricter, up-to-date test conditions and more realistic fuel-consumption and CO_2 emission values ([24]).

EU legislation sets mandatory emission reduction targets for new cars and vans ([25]). This legislation is the cornerstone of the EU's strategy to improve the fuel economy of cars and vans sold on the European market.

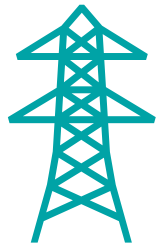
As part of its Clean Mobility Package, the Commission has proposed new CO_2 emission standards for cars and vans for 2025 and 2030 ([26]) and, for the first time ever, additional emission standards for heavy-duty vehicles in the EU for 2025 and 2030 ([27]). Both proposals include a mechanism to encourage the uptake of zero- and low-emission vehicles in a technology-neutral way. The Commission is thus taking action towards the goal of modernising the EU transport sector.

Energy consumption

The availability of reliable and affordable energy is a prerequisite for the functioning and growth of European economies. However, increased energy consumption may put further pressure on the environment, deplete fossil fuels and intensify the EU's dependency on imported energy. To countervail these negative effects, the EU aims to use energy more efficiently and shift towards using renewable energy sources.

The EU is on track to reach its renewable-energy target, but additional progress is needed to meet the energy-efficiency targets

Using energy more efficiently and increasing the share of renewables allows for further growth while reducing environmental impacts, dependencies and costs linked to energy supply and use. Therefore the EU seeks to boost its energy efficiency by 20 % and to increase its share of renewable energy to 20 % of energy consumption by 2020.



1 542.7
Mtoe of primary energy were consumed in the EU in 2016

In order to measure progress with regards to the energy-efficiency target, it has been translated into absolute target values for primary energy consumption (1 483 Mtoe) and final energy consumption (1 086 Mtoe) for 2020. In 2016, 1 542.7 Mtoe of primary and 1 107.7 Mtoe of final energy were consumed. Overall, the consumption of primary and final energy fell in the long term (between 2001 and 2016) by 7.0 % and 4.2 %, respectively. In the short term (since 2011), the decrease has been lower for both primary and final energy consumption. As primary and final energy consumption have been rising again since 2014, the 2020

1 107.7
Mtoe of final energy were consumed in the EU in 2016

energy-efficiency targets, particularly for final energy consumption, may be beyond reach. In contrast, the share of renewable energy in energy consumption shows a clearly favourable trend. The EU steadily increased its share, from 8.5 % in 2004 to 17.0 % in 2016, and is well on track to meet its 2020 target (see chapter on SDG 7 'Affordable and clean energy' on page 144).

In 2016, renewable energy sources in gross final energy consumption had a share of

17.0 %

Waste generation and management

Production and consumption patterns characterised by products being made, used and disposed of in an accelerated fashion are not efficient. With increased levels of consumption such patterns are coming up against constraints. Therefore, the EU aims to establish a circular economy where materials and resources are kept in the economy for as long as possible, and waste is minimised.

Reducing both the input of materials and the output of wastes by closing economic and ecological loops of resource flows is an important aspect of a circular economy. In 2014, 871 million tonnes of waste, excluding major mineral waste, were generated, which corresponds to 1 717 kilograms of waste per EU inhabitant ([28]). When not managed sustainably, all of this waste could have a huge impact on the environment, causing pollution and greenhouse gas emissions that contribute to climate change, as well as to significant losses of materials ([29]). Waste cannot always be avoided and should be seen as a resource. Increased recycling rates would put materials back in the economy and ensure they are kept in circulation in order to preserve the value embedded in them.

1 717

kg of waste (excluding major mineral waste) were generated in the EU per inhabitant in 2014

Favourable trends in waste generation, prevention, treatment and circularity

Between 2004 and 2014, the amount of waste generated per capita, excluding major mineral wastes, decreased by 10 % in the EU. Over the same period the EU circular material use (CMU) rate, indicating the share of used materials that came from collected waste, increased from 8.3 % to 11.4 %. Data for the recycling of waste excluding major mineral wastes are only available from 2010 onwards and show a slight increase between 2010 and 2014, from 53 % to 55 %. However, despite having considerably higher end-of-life recycling rates, the relatively low degree of circularity in the EU can be attributed to two structural barriers.

Building on existing EU policies and legislation, the Circular Economy Package ([30]) establishes a programme of action with measures covering the whole cycle from production and consumption to waste management. This package includes commitments on ecodesign, waste prevention and reuse, clean material cycles, and ambitious quantitative targets that aim to increase recycling and reduce landfilling, as well as obligations to improve the separate collection of waste and promote the efficient use of bio-based resources. The new waste legislation proposed as part of this package was adopted in 2018. This introduced ambitious measures for waste prevention and for the recycling of municipal and packaging waste, such as raising targets for recycling municipal waste to 65 % by 2035, reducing the landfilling of municipal waste to 10 % by 2035 and for ensuring high recycling levels for packaging and its specific materials.

First, a large fraction of the materials is used to build and maintain buildings, infrastructure and other long-life goods and is therefore not available for recycling. A second barrier is the large amount of materials used for energy generation. For these materials, in particular for fossil-energy materials, closing the loop is hardly possible and the high share of these materials keeps the degree of circularity low ([31]).

11.4 % of the materials used in the EU came from collected waste in 2016

In 2014, a third of wastes (excluding major mineral wastes) was made up of mixed ordinary wastes. This category includes wastes from households, mixed undifferentiated materials and sorting residues. Wastes merged in the 'recyclable wastes' category, such as metal, glass, paper and plastic, accounted for around a quarter, followed by combustion waste (15 %), animal and vegetal wastes (10 %), chemical and medical wastes (6 %) and mineral wastes from waste treatment and stabilised wastes (5 %).

Common sludges and equipment had a share of around 2 % each in 2014 ([32]).

With a share of 55 % in 2014, more than half of the waste that underwent waste treatment in the EU was recycled. A quarter of the generated wastes went to landfill, meaning the deposit of waste onto or into land. While landfilling fell from 28 % in 2010 to 25 % in 2014, incineration with energy recovery increased from 11 % in 2010 to 14 % in 2014. Other treatment methods collectively accounted for less than 10 % of waste treatment over the whole period analysed.

55.0 % of waste treated in the EU was recycled in 2016

Recycling rates appear to be higher for total waste (excluding major mineral wastes) than for municipal waste alone. Despite a considerable increase over the past decade, recycling rates of municipal waste remained below 50 % in the EU (45.3 % in 2016) ([33]). This is because landfill and incineration are the dominant treatment operations for municipal waste. However, there was a significant shift from landfill

A multi-stakeholder platform (EU Platform on Food Losses and Food Waste) was established in 2016 to support all parties in taking concrete action, share best practice and learning, and thereby accelerate the EU's progress towards reducing food waste. The Commission has also adopted EU guidelines to facilitate food donation (2017), as well as the valorisation of food no longer intended for human consumption as animal feed (2018). The revised Waste Framework Directive, adopted in 2018, requires Member States to reduce food waste at each stage of the food supply chain, and monitor and report annually on food waste levels. The Commission will adopt, by March 2019, tertiary legislation laying down a common methodology to measure food waste and a reporting format.

to incineration for energy recovery. While in 2011, 34.4 % of municipal waste went to landfill and 24.0 % to incineration, in 2016 the share of landfill was slightly lower (24.4 %) than for incineration (27.6 %) ([34]).

In 2014, 7.0 % of the generated waste (excluding major mineral wastes) — corresponding to 120 kg per resident — was hazardous to health or the environment. The share of hazardous waste shows diverging trends over the short and long terms. While the share increased by 1.2 percentage points overall (between 2004 and 2014), in the short term since 2010 the share has fallen by 0.2 percentage points ([35]).

120 kg
of hazardous waste were generated in the EU per inhabitant in 2016

Although the absolute amount of generated waste (excluding major mineral wastes) fell significantly between 2004 and 2014, the development was not uniform across all economic sectors. Waste that arose within the waste-management system ([36]) grew by 84 % and accounted for more than one quarter (27 %) in 2014. The second largest share of waste (23 %) was generated by households, but their share remained relatively stable over the same period. Waste generated by manufacturing dropped over this 10 year-period by about a third and accounted for 21 % in 2014. Provision of utilities (electricity, gas, steam, and air condition) and services each accounted for 10 % of waste generation in 2014 ([37]).

The Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan ([38]) includes a series of proposals on sustainable consumption and production that will contribute to improving the environmental performance of products and increase the demand for more sustainable goods and production technologies.

Presentation of the main indicators

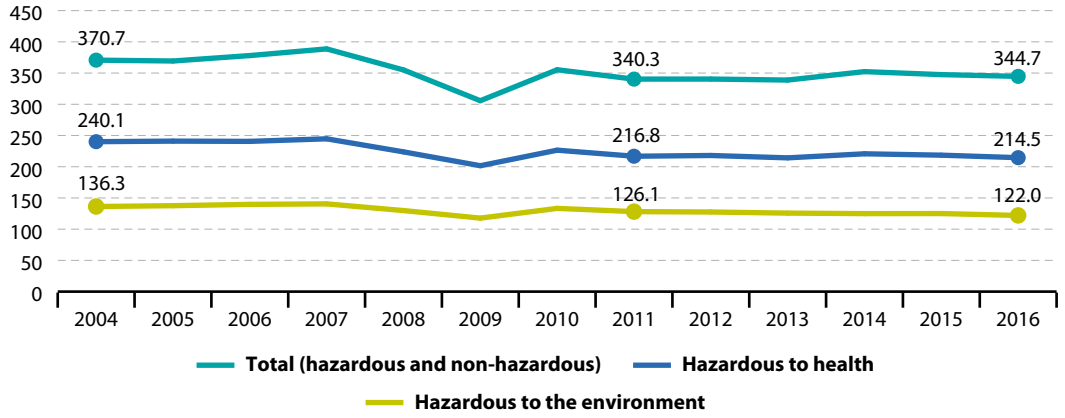
LONG TERM 2004–2016

SHORT TERM 2011–2016

Consumption of toxic chemicals

The indicator measures the volume of aggregated consumption of chemicals, expressed in million tonnes. The consumption of chemicals is calculated as the sum of the production volumes and the net import volumes of the chemicals according to the equation: consumption = production + imports – exports. The data on hazardous and non-hazardous chemicals show the total consumption of all chemicals regardless of their hazardousness. The two sub-categories on consumption of hazardous chemicals – hazardous to human health and hazardous to the environment – overlap by definition and data cannot be summed up.

Figure 12.1: Consumption of toxic chemicals by hazardousness, EU-28, 2004–2016
(million tonnes)



Source: Eurostat (online data code: sdg_12_10)

As Figure 12.1 indicates, the amount of toxic chemicals used in the EU declined only slightly over the past decade. Between 2004 and 2016, the consumption of chemicals hazardous to the environment and chemicals hazardous to health fell by 0.92 % and 0.94 % on average per year, respectively. In the short term since 2011, the average yearly decline has been stronger for chemicals hazardous to the environment (– 0.97 %) than for chemicals hazardous to health (– 0.21 %).

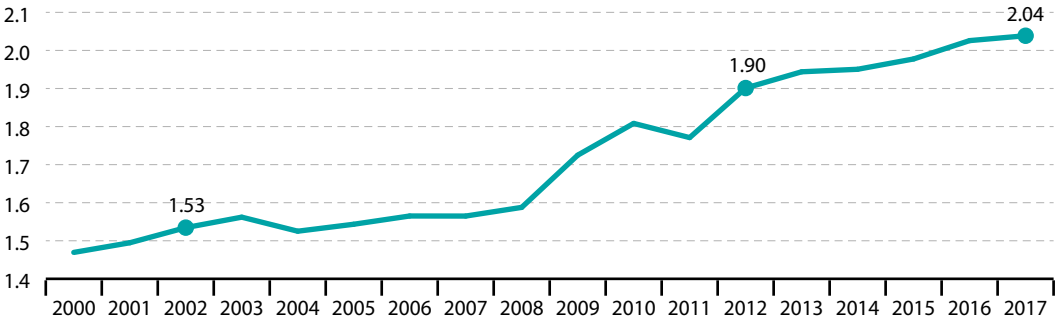
Resource productivity and domestic material consumption

LONG TERM 2002–2017

SHORT TERM 2012–2017

Resource productivity is defined as gross domestic product (GDP) divided by domestic material consumption (DMC). DMC measures the total amount of materials directly used by an economy. It is calculated as the annual quantity of raw materials extracted from the domestic territory of the focal economy, plus all physical imports, minus all physical exports.

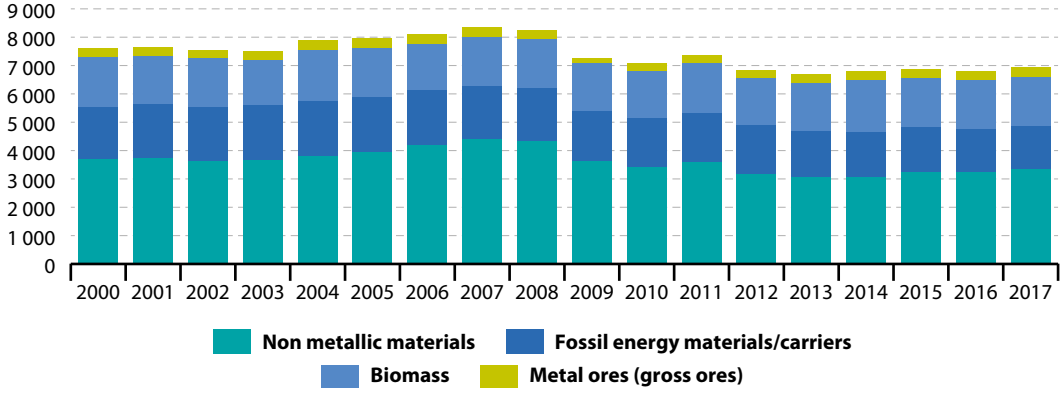
Figure 12.2: Resource productivity, EU-28, 2000–2017
(EUR per kg, chain-linked volumes (2010))



Note: Data are estimates (whole time series); data for 2016 and 2017 are provisional.
Source: Eurostat (online data code: sdg_12_20)

As shown in Figure 12.2, the EU has become more productive in its material use since 2000. Over the long-term period from 2002 to 2017, the EU's resource productivity rose by an average of 1.9 % per year. In the short term from 2012 to 2017, the productivity gains slowed down slightly, with an average growth of 1.4 % per year.

Figure 12.3: Domestic material consumption by material, EU-28, 2000–2017
(million tonnes)

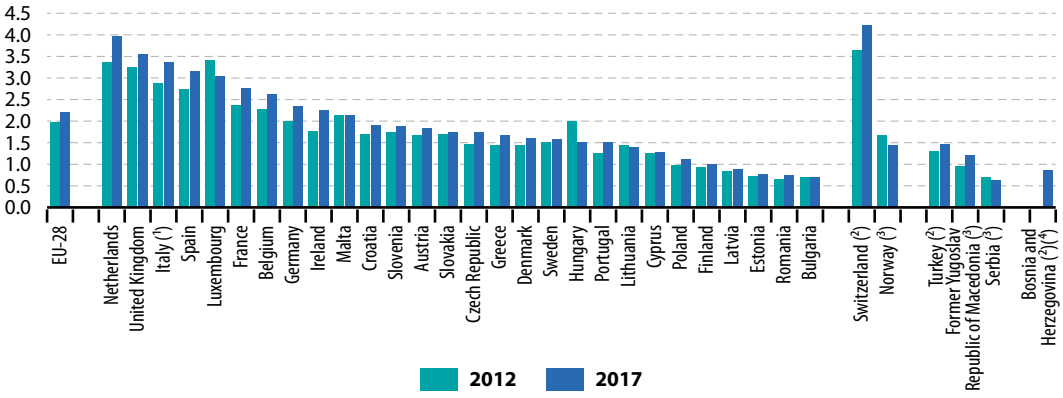


Note: Data are estimates, data for 2016 and 2017 are provisional.
Source: Eurostat (online data code: env_ac_mfa)

The EU material demand has declined since the onset of the economic crisis in 2008. Between 2002 and 2017, DMC in the EU fell by 0.5 % on average per year. However, in the short term since 2012, DMC has increased by 0.3 % per year on average, following the economic recovery.

A closer look at the components of DMC shows that the long-term reduction was driven mainly by a slowdown in domestic extraction of 8.5 % between 2002 and 2017. Domestic extraction accounted for about 85 % of DMC and was therefore one of the main drivers behind changes in DMC between 2002 and 2017. Imports of materials have risen by 15.1 % since 2002, accounting for 25.5 % of DMC in 2017.

Figure 12.4: Resource productivity, by country, 2012 and 2017
(PPS per kg)



Note: Provisional and/or estimated data for most countries.
(1) Break in time series in 2015.
(2) 2015 data (instead of 2017).
(3) 2016 data (instead of 2017).
(4) No data for 2012.

Source: Eurostat (online data code: sdg_12_20)

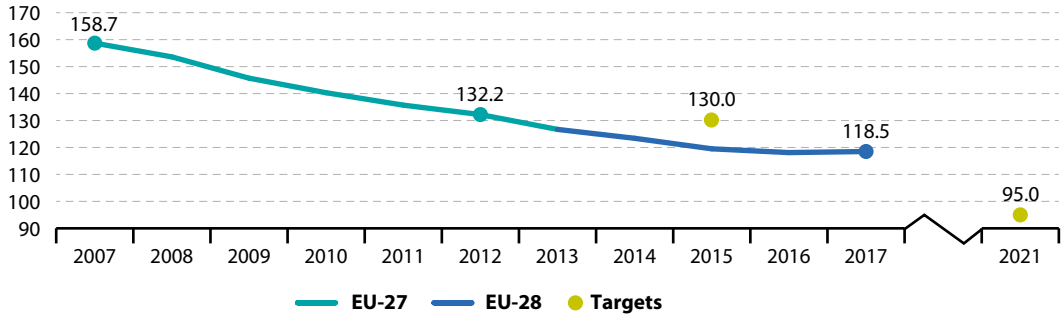
Average CO_2 emissions per km from new passenger cars

LONG TERM 2007–2017

SHORT TERM 2012–2017

The indicator is defined as the average carbon dioxide (CO_2) emissions per km by new passenger cars in a given year. The reported emissions are based on type-approval and can deviate from the actual CO_2 emissions of new cars. Data presented in this section are provided by the European Commission, the Directorate-General for Climate Action and the Environmental European Agency (EEA).

Figure 12.5: Average CO_2 emissions per km from new passenger cars, EU-27 and EU-28, 2007–2017
($g\ CO_2$ per km)

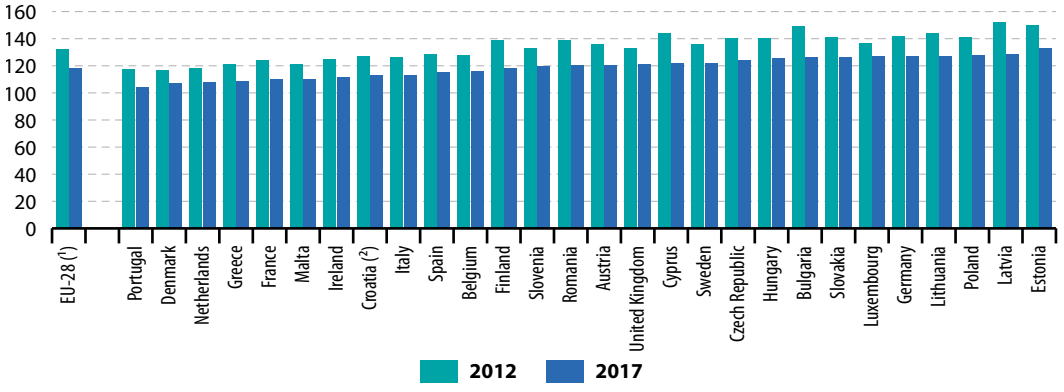


Note: 2017 data are provisional.

Source: Eurostat (online data code: sdg_12_30)

As shown in Figure 12.5, the EU has made progress towards a cleaner car fleet over the past decade, although the trend has slowed down in recent years. Between 2007 and 2017, emissions fell by 2.9 % per year on average, whereas in the short term from 2012 to 2017 the decline amounted to an average of only 2.2 % per year. While the target for 2015 was met two years in advance, further progress seems necessary to reach the 2021 target.

Figure 12.6: Average CO_2 emissions per km from new passenger cars, by country, 2012 and 2017
($g\ CO_2$ per km)



Note: 2017 data are provisional (all countries). (1) 2012 data refer to EU-27. (2) 2013 data (instead of 2012).

Source: Eurostat (online data code: sdg_12_30)

LONG TERM 2004–2014

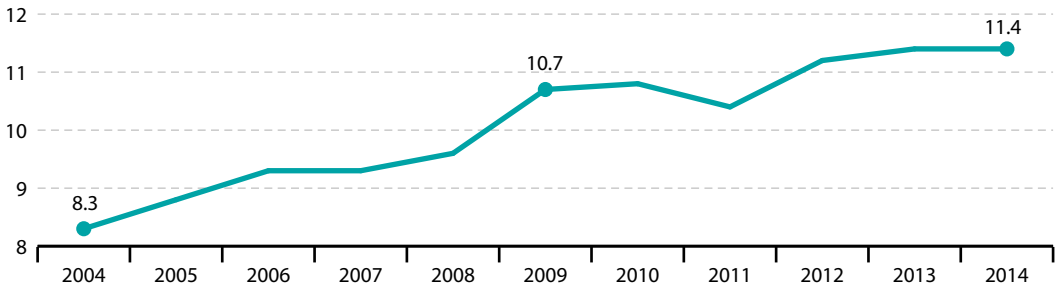
SHORT TERM 2009–2014

Circular material use rate

The circular material use rate (CMU) measures the degree of circular (secondary) materials in the economy in relation to the overall material use. A higher amount of secondary materials substituting primary raw materials avoids extraction of primary material. The CMU is calculated as the ratio of the amount of secondary raw materials to the overall material input for domestic use.

Figure 12.7: Circular material use rate, EU-28, 2004–2014

(%)

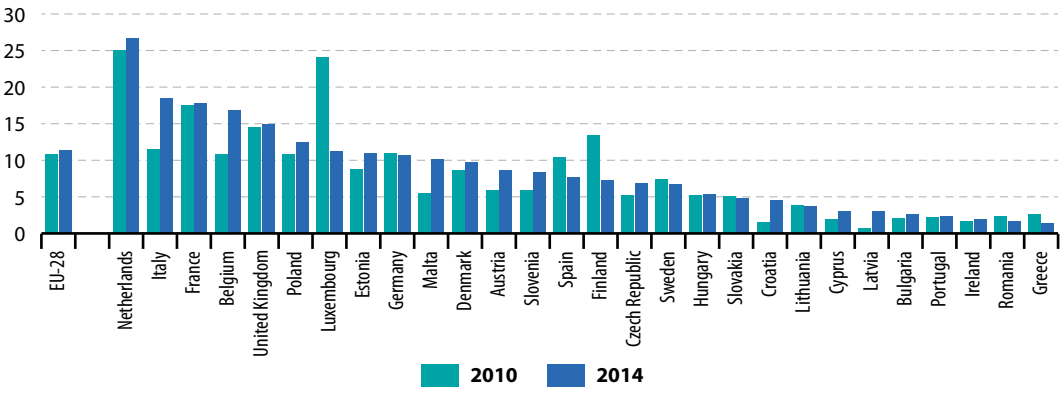


Source: Eurostat (online data code: sdg_12_41)

Figure 12.7 shows an almost continuous rise in the share of secondary materials in the EU's overall material usage since 2004. Between 2004 and 2014, the CMU rate increased by 3.2 % on average per year. However, growth was lower in the short term period from 2009 to 2014, with an annual average increase of 1.3 %.

Figure 12.8: Circular material use rate, by country, 2010 and 2014

(%)



Source: Eurostat (online data code: sdg_12_41)

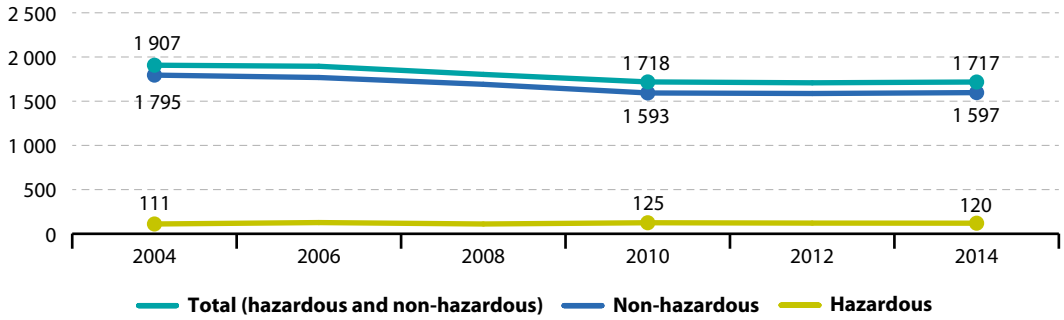
Generation of waste excluding major mineral wastes

LONG TERM 2004–2014

SHORT TERM 2010–2014

This indicator is defined as all waste generated in a country, excluding major mineral wastes, dredging spoils and contaminated soils. This exclusion enhances comparability across countries as mineral waste accounts for high quantities in some countries with important economic activities such as mining and construction.

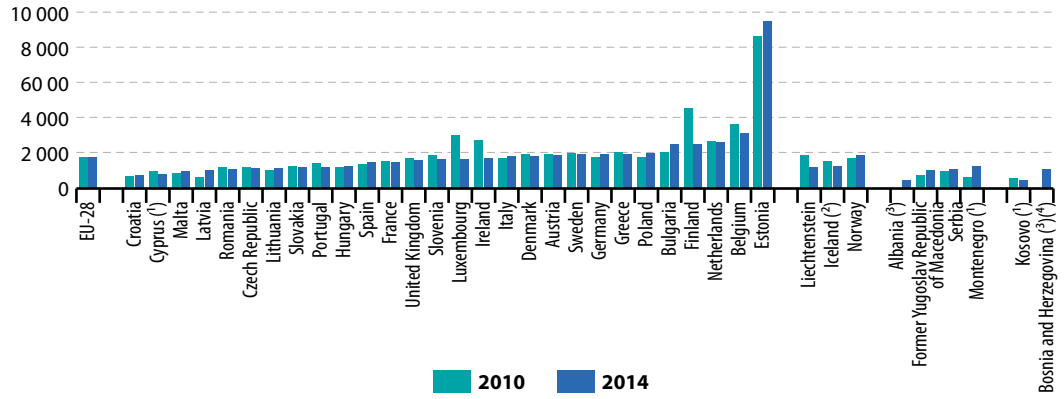
Figure 12.9: Generation of waste excluding major mineral wastes by hazardousness, EU-28, 2004–2014
(kg per capita)



Source: Eurostat (online data code: sdg_12_50)

As shown in Figure 12.9, generation of waste — excluding major mineral wastes — has declined in the EU over the past decade. The per capita amount of waste (excluding major mineral wastes) fell by 1.0 % on average per year between 2004 and 2014. The reduction was lower in the short term, with an annual average decrease of 0.01 % between 2010 and 2014.

Figure 12.10: Generation of waste excluding major mineral wastes, by country, 2010 and 2014
(kg per capita)



(1) 2012 data (instead of 2010).
(2) Break in time series in 2014.
(3) No data for 2010.
(4) 2012 data (instead of 2014).

Source: Eurostat (online data code: sdg_12_50)

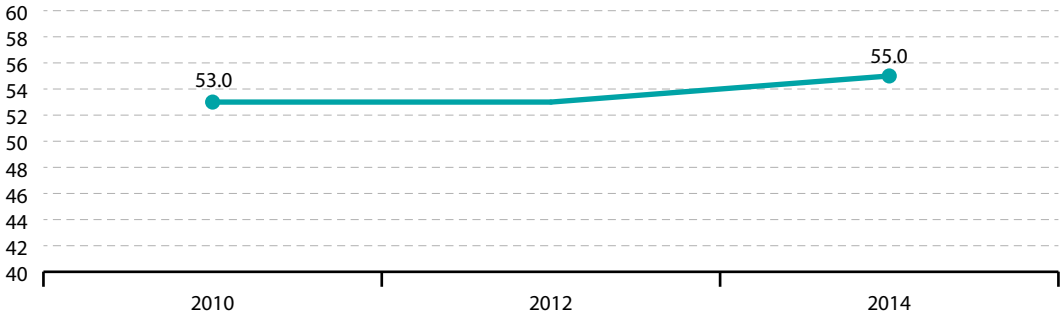
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2010–2014

Recycling rate of waste excluding major mineral wastes

The indicator measures the share of a country's — or the EU's — own waste that is recycled. 'Recycling' means any recovery operation by which waste materials are reprocessed into products, materials or substances, whether for the original or other purposes. It does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations. Major mineral wastes, dredging spoils and contaminated soils are excluded. The data reflect the treatment of national waste and exclude waste that is imported from non-EU countries.

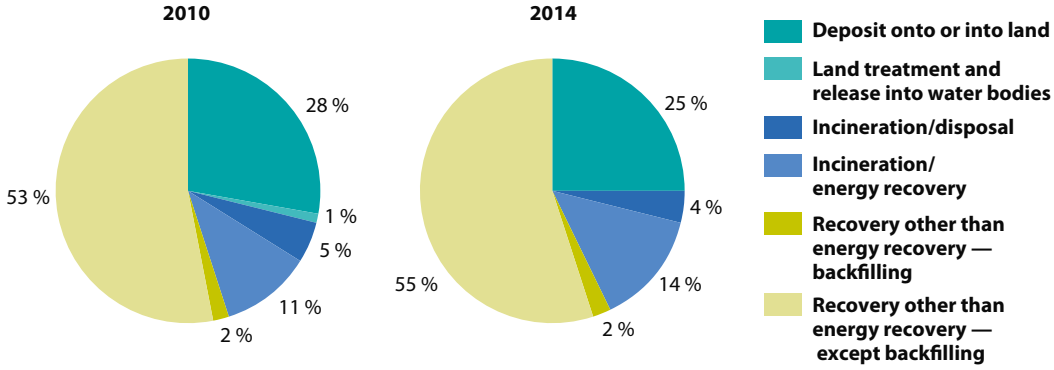
Figure 12.11: Recycling rate of waste excluding major mineral wastes, EU-28, 2010–2014
(%)



Source: Eurostat (online data code: sdg_12_60)

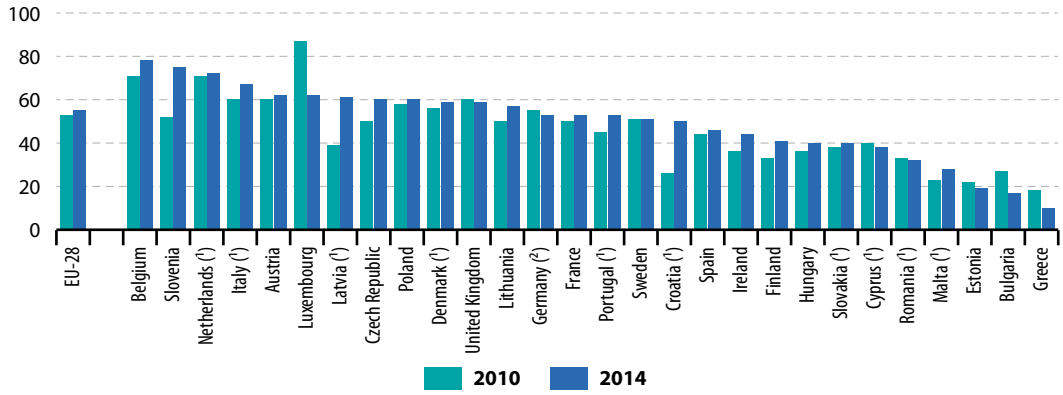
Figure 12.11 indicates a slight increase in the recycling rate of waste. Between 2010 and 2014, the EU recycling rate grew by 0.9 % on average per year. Figure 12.12 shows that the biggest part of waste that is not recycled is deposited onto or into land.

Figure 12.12: Management of waste excluding major mineral waste, by waste operations, EU-28, 2010 and 2014
(%)



Source: Eurostat (online data code: env_wasoper)

Figure 12.13: Recycling rate of waste excluding major mineral wastes, by country, 2010 and 2014
(%)



(1) Definition differs.

Source: Eurostat (online data code: sdg_12_60)

Further reading on responsible consumption and production

European Environment Agency (2016), *The European environment — state and outlook 2015. Synthesis report — chapter 4. Resource efficiency and the low-carbon economy*, Copenhagen, EEA.

European Environment Agency (2016), *More from less — material resource efficiency in Europe*, EEA Report No 10/2016, Copenhagen, EEA.

European Environment Agency (2016), *Prevention of hazardous waste in Europe — the status in 2015*, EEA Report No 35/2016, Copenhagen, EEA.

European Environment Agency (2017), *Circular by design — Products in the circular economy*, EEA Report No 6/2017, Copenhagen, EEA.

UNEP (2017), *Resource Efficiency: Potential and Economic Implications. A report of the International Resource Panel*.

European Commission (2016), *Green growth for jobs and prosperity in the EU : report of the European Commission expert group 'R&I policy framework for green growth & jobs'*, Luxembourg.

Haas, W., Krausmann, F., Wiedenhofer, D., Heinz, M. (2015), How Circular is the Global Economy?: An Assessment of Material Flows, Waste Production, and Recycling in the European Union and the World in 2005, in *Journal of Industrial Ecology*, October 2015, Vol.19(5), pp.765–777.

Further data sources on responsible consumption and production

Eurostat, Generation of waste by waste category, hazardousness and NACE Rev. 2 activity.

Eurostat, Resource Efficiency Scoreboard.

Eurostat, Monitoring Framework for the Circular Economy.

UNEP, Natural Resources: Resource Efficiency Indicators.

Notes

(1) European Parliament and Council of the European Union (2013), Decision No 1386/2013/EU on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
(2) Resource productivity is defined as GDP per unit of domestic material consumption (DMC), measured in EUR per kilogram. Part of these materials is directly consumed by households, which means that they are not used as an input to production activities. Thus, resource productivity is not directly comparable to concepts such as labour or capital productivity.
(3) Energy productivity is defined as GDP per unit of gross inland energy consumption, measured in EUR per kg of oil equivalent. Part of the energy considered is consumed by households, which means that it is not used as an input to production activities. Thus, energy productivity is not directly comparable to concepts such as labour or capital productivity. Note that the indicator's inverse is energy intensity.
(4) Source: Eurostat (online data code: nama_10_gdp).
(5) Source: Eurostat (online data code: nrg_100a).
(6) European Commission (2014), *Study on modelling of the economic and environmental impacts of raw material consumption*, p. 5.
(7) European Environment Agency (2016), *More from less — material resource efficiency in Europe. 2015 overview of policies, instruments and targets in 32 countries*, EEA report No 10/2016, p. 38.
(8) Ibid.
(9) Id., p. 122.
(10) 'Other products' and 'waste for final treatment and disposal' accounts for 0.2 %.
(11) European Environment Agency (2016), *More from less — material resource efficiency in Europe. 2015 overview of policies, instruments and targets in 32 countries*, EEA report No 10/2016, p. 35.
(12) The European Chemical Industry Council (2016), *European Chemical Industry Facts and Figures Report 2017*, p. 5.
(13) European Parliament and Council of the European Union (2013), Decision No 1386/2013/EU on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
(14) European Parliament and Council of the European Union (2006), Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
(15) European Environment Agency (2018), Consumption of hazardous chemicals.
(16) Ibid.
(17) Eurostat (2016), *Compilation of chemical indicators. Development, revision and additional analysis*, p. 43.
(18) European Commission, Climate Action, Reducing CO_2 emissions from passenger cars.
(19) European Parliament and Council of the European Union (2014), Regulation (EU) No 333/2014 amending Regulation (EC) No 443/2009 to define the modalities for reaching the 2020 target to reduce CO_2 emissions from new passenger cars.
(20) For more information on a limit value curve see European Commission (2007), *Questions and answers on the proposed regulation to reduce CO_2 emissions from cars*, Press release database.
(21) See Passenger cars per 1 000 inhabitants, Source: Eurostat (online data code: road_eqs_carhab).
(22) Tietge, U. et al. (2016), *From Laboratory to Road — A 2016 update of official and 'real world' fuel consumption and CO_2 values for passenger cars in Europe*, International Council on Clean Transportation.
(23) European Environment Agency (2017), *Fuel efficiency improvements of new cars in Europe slowed in 2016;* European Environment Agency (2016), *Explaining road transport emissions: a non-technical guide.*
(24) European Commission (2017), European Commission recommendation 2017/948 of 31 May 2017 on the use of fuel consumption and CO_2 emission values type-approved and measured in accordance with the World Harmonised Light Vehicles Test Procedure when making information available for consumers pursuant to Directive 1999/94/EC of the European Parliament and of the Council.
(25) European Parliament and Council of the European Union (2009), Regulation (EC) No 443/2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicle.
(26) European Commission (2017), Proposal for a regulation of the European Parliament and of the Council setting emission performance standards for new passenger cars and for new light commercial vehicles as part of the Union's integrated approach to reduce CO_2 emissions from light-duty vehicles and amending Regulation (EC) No 715/2007.
(27) European Commission (2018), Proposal for a regulation of the European Parliament and of the Council setting CO_2 emission performance standards for new heavy-duty vehicles.
(28) Source: Eurostat (online data code: env_wasgen).
(29) European Commission (2010), *Being wise with waste: the EU's approach to waste management*.
(30) Haas, W., Krausmann, F., Wiedenhofer, D., Heinz, M., (2015), How Circular is the Global Economy?: An Assessment of Material Flows, Waste Production, and Recycling in the European Union and the World in 2005, in *Journal of Industrial Ecology*, October 2015, Vol.19(5), pp. 765–777.
(31) European Commission (2015), *Closing the loop — An EU action plan for the Circular Economy*, COM(2015) 614 final, Brussels.
(32) Source: Eurostat (online data code: env_wasgen).
(33) Source: Eurostat (online data code: sdg_11_60).
(34) Source: Eurostat (online data code: env_wasmun)

([35]) Source: Eurostat (online data code: env_wasgen).
([36]) This category includes the NACE Rev. 2 activities waste collection, treatment and disposal activities; materials recovery (E 38), Water collection, treatment and supply; sewerage; remediation activities and other waste management services (E36, E37, E39) and wholesale of waste and scrap (G4677).
([37]) Source: Eurostat (online data code: env_wasgen).
([38]) European Commission (2008), *Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan {SEC(2008) 2110} {SEC(2008) 2111}*, COM(2008) 397 final, Brussels.

13 Take urgent action to combat climate change and its impacts

Goal 13 seeks to implement the commitment to the United Nations Framework Convention on Climate Change, to operationalise the Green Climate Fund and aims to strengthen countries' resilience and adaptive capacity to climate-related hazards and natural disasters with a special focus on supporting least-developed countries.

eurostat supports the SDGs

Climate change already has observable effects, such as an increase in average global air and ocean temperatures, changes in precipitation patterns, a rising global average sea level and rising ocean acidity. The impacts of climate change threaten the viability of social, environmental and economic systems and may make some regions less habitable due to food and water scarcity. As reflected in the Europe 2020 strategy, the EU pursues climate change mitigation and adaptation strategies, for example, by reducing emissions of greenhouses gases and increasing the share of renewable energy in energy consumption. Moreover, through the 2013 Adaptation Strategy, the EU works to increase the climate resilience of its Member States and the EU as a whole. Since climate change is a global, cross-border challenge that affects areas differently, it demands international coordination and cooperation. Europe has taken a leading role in this context by engaging in international negotiations, pursuing the goals of the Paris Agreement and supporting climate initiatives around the world.

Table 13.1: Indicators measuring progress towards SDG 13, EU-28

Indicator		Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Climate mitigation				
Greenhouse gas emissions		↑	↑	page 247
Greenhouse gas emissions intensity of energy consumption		↗	↗	page 249
Energy consumption (*)	Primary energy consumption	↗	↗	SDG 7, page 140
	Final energy consumption	↗	↘	
Share of renewable energy in gross final energy consumption (*)		↑ (1)	↑	SDG 7, page 144
Average CO_2 emissions per km from new passenger cars (*)		↗ (2)	↗	SDG 12, page 229
Climate impacts				
Mean near surface temperature deviation		:	:	page 250
Climate-related economic losses		:	:	page 251
Mean ocean acidity (*)		:	:	SDG 14, page 272
Support to climate action				
Contribution to the international 100bn USD commitment on climate-related expending		:	:	page 252
Population covered by the Covenant of Mayors for Climate and Energy signatories		:	:	page 254

(*) Multi-purpose indicator.
(1) Past 12-year period.
(2) Past 10-year period.

Table 13.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Climate action in the EU: overview and key trends

Monitoring SDG 13 in an EU context focuses on the topics climate mitigation, climate impacts and on initiatives that provide support to climate action. Over the past few years, the EU has achieved progress in climate mitigation, as shown in Table 13.1. The trends for the other two sub-themes, however, cannot be assessed due to various data issues.

Climate mitigation

Climate mitigation aims to decrease emissions of climate-harming greenhouse gases (GHG) that originate from human activity or to enhance GHG sinks through an array of measures, such as the promotion of low-carbon technologies, the protection of forests and land use policy. The EU also pursues climate adaptation and resilience objectives as part of the Europe 2020 strategy ([1]) (see section on resilience to climate impacts on page 242). Annual change in GHG emissions serves as the main indicator to track the success of climate mitigation measures. In the EU, the highest share of emissions comes from the production and consumption of energy ([2]). As a result, curbing climate change in the EU context requires a shift to less carbon-intensive energy systems and cleaner (less GHG-intensive) and more resilient economies. A further indication of climate mitigation progress can be found in the rising share of renewable energy in energy consumption and increased energy efficiency in households, industry, the transport sector and the energy sector itself.

The EU has reduced its GHG emissions by 22.4 % compared to 1990

As part of its Europe 2020 strategy, the EU set a target to reduce GHG emissions by 20 % by 2020 compared to 1990. In 2016, EU emissions had already fallen by 22.4 %, putting them on track to meeting the 2020 target. A large proportion of these reductions have occurred over the past 15 years, with emissions falling by 16.8 % between 2001 and 2016. Reductions during the early 1990s were the result of many factors, including structural changes and the modernisation of

Under the Europe 2020 strategy ([3]), the EU seeks to reduce greenhouse gas emissions by 20 % compared to 1990, improve energy efficiency by 20 % and increase the share of renewables in final energy consumption to 20 % by 2020.

In 2014, the European Council agreed on the 2030 Climate and Energy Framework ([4]), which includes 2030 targets for GHG emissions, renewable energy and energy efficiency. In June 2018, an inter-institutional political agreement ([5]) increased the ambition of the latter two targets for renewable energy and energy efficiency to their current values: at least a 40 % cut in GHG emissions (from 1990 levels), at least a 32 % share for renewable energy and at least a 32.5 % improvement in energy efficiency (compared to a projected business-as-usual scenario for 2030).

The Energy Union ([6]) further supports the shift towards a resource-efficient, low-carbon economy to achieve sustainable growth through legal frameworks and related initiatives, highlighting renewables as a key element of decarbonisation.

Finally, the EU cohesion policy (2014 to 2020) ([7]) sets aside EUR 29 billion for sustainable energy programmes and initiatives, including for energy efficiency, renewable energy, smart energy infrastructure and low-carbon research and innovation.

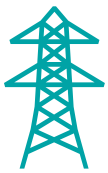
European industries as well as a broad shift towards service economies and the use of natural gas ([8]). In the following years, until 2007, emissions more or less stabilised. Around the same time, rising primary energy consumption was increasingly offset by low-carbon energy production, particularly renewable energy, which rose from an 8.5 % share in the energy mix in 2004 to 10.5 % in 2007 ([9]). Also, during this period, manufacturing industries became more energy-efficient, the waste sector reduced the amount of emissions from solid waste disposal and agriculture reduced livestock and used less nitrogenous fertilisers ([10]).

The EU reduced its GHG emissions by

16.8 %

between 2001 and 2016

Between 2008 and 2009 the economic crisis reduced industrial production, transport volumes and energy demand sharply, leading to a relatively steep decline in GHG emissions in the EU. Although gross domestic product (GDP) growth gradually picked up again in the following years, GHG emissions kept falling, due in large part to improvements in electricity generation and heat production (especially in thermal power stations), increased renewable energy generation and advances in energy efficiency ([11]). Primary and final energy consumption, for instance, fell by 7.0 % and 4.2 %, respectively, in the period 2001 to 2016 ([12]). Between 2008 and 2016, the share of renewable energy in final energy consumption increased by an additional 53.2 % — in 2016 the total share amounted to 17.0 % ([13]). In addition, unprecedentedly high average annual temperatures and a general trend towards milder winters have reduced the need for heating fuel.



The EU reduced its primary energy consumption by

7.0 %

between 2001 and 2016

Final energy consumption fell by

4.2 %

in the EU between 2001 and 2016

A sectoral break down of the years 1990 and 2016 shows that all sectors of the economy contributed to GHG emissions reductions, except transport. Fuel combustion in the energy industries showed the strongest absolute decrease in emissions, although it remained the main source in 2016. In contrast, transport emissions (excluding international aviation and shipping) were still 18.3 % higher in 2016 than in 1990, despite reductions between 2007 and 2014. After 2007, fuel price rises along with the economic recession reduced demand for freight transport, and energy efficiency improvements as a result of CO_2 standards for new cars and vans contributed to emissions reductions, especially for passenger cars ([14]). However, these could not offset growth in passenger car traffic. Transport accounted for 21.0 % of total EU emissions (excluding land use, land use change and forestry (LULUCF) and memo items; including international aviation) and was therefore the second largest emitter in the EU after the energy industries (26.9 %). Emissions from international aviation were more than twice as high in 2016 compared to their 1990 levels.

17.0 %

of energy consumed in the EU in 2016 came from renewable sources

118.5

grams of CO_2 per km were emitted by new passenger cars in the EU in 2017

Although overall GHG emissions from transport have not reduced in line with other economic sectors, CO_2 emissions per km for new passenger cars have been continuously falling since 2007. Between 2012 and 2017, emissions per km decreased by 10.4 % or 13.7 grams, reaching 118.5 grams of CO_2 per km in 2017. Nevertheless, further progress will be required to meet the 2021 target of 95 grams of CO_2 per km driven.

Transport is a key sector in terms of the EU's commitments under the Paris Agreement. The Commission's European Strategy for Low-Emission Mobility ([15]) seeks to reduce GHG emissions from transport by 60 % by 2050 compared to 1990 levels and further aims to put the sector on a path towards zero emissions.

Additionally, the EU's Accelerating Clean Energy Innovation ([16]) initiative aims to facilitate the clean energy transition through targeted research and innovation.

The 2009 Fuel Quality Directive ([17]) sets standards for the quality of road transport fuels with a focus on reducing GHG emissions and improving air quality. In 2014, the EU amended the 2009 regulation, setting a new mandatory emission reduction goal for passenger cars of 95 grams of CO_2 per km by 2021 ([18]).

While the current CO_2 emission standards for cars and vans up to 2020/21 have contributed to emissions reductions from new light duty vehicles since 2007, the Commission has proposed new CO_2 emission standards for cars and vans for 2025 and 2030 ([19]) and, for the first time ever, additional emission standards for heavy-duty vehicles in the EU for 2025 and 2030 ([20]). Both proposals include a mechanism to encourage the uptake of zero- and low-emission vehicles in a technology-neutral way. With the 2016 'Strategy on low-emission mobility' ([21]) and the initiatives foreseen by the 2017 and 2018 'Europe on the Move' packages, the European Commission is taking action to modernise the EU's mobility and transport. The aim is to help the sector to stay competitive while making a socially fair transition towards clean energy and digitalisation. Further information can be found on the website of the Directorate-General for Mobility and Transport.

At the Member State level, significant differences in GHG emission trends can be observed between 1990 and 2016, ranging from reductions of almost 60 % to increases of more than 50 %. Most countries have reduced their emissions, with the largest relative falls taking place in the Baltic countries and some central and south-eastern European countries. For eastern European countries in particular, economic developments after 1990 led to extensive GHG reductions, which were further spurred on by modernisation in electricity and central heat production, as well as in direct fuel use such as for heating purposes.

Per capita emissions have continued to fall in most EU countries

For a more equalised comparison of countries' GHG emissions, population differences need to be taken into account. Across the EU, per capita GHG emissions in 2016 ranged from 5.0 tonnes to 19.8 tonnes of CO_2 equivalents. Luxembourg by far exceeded the per capita emissions of other Member States, which can be partly attributed to a considerably higher number of commuters and transit traffic flowing into and through the country ([22]). Most countries reduced their per capita GHG emissions compared to 2001, except the Baltic states, Bulgaria and Poland which, after tremendous reductions in the 1990s, saw increases ranging from 2.9 % to 25.0 %.

GHG intensity of EU energy consumption has decreased gradually over the past two decades

The GHG intensity of energy is measured as the ratio between energy-related emissions and consumption — emissions per unit of energy consumed. Between 2001 and 2016, GHG intensity of energy consumption fell by 11.9 % with most progress reported in Malta (30.0 %), Finland (28.6 %), Denmark (23.7 %) and Sweden (22.6 %). These developments can be explained by a gradual shift away from GHG-intensive energy sources. Between 1990 and 2016, gross

inland consumption of coal (and other solid fuels) and oil decreased from 65.1 % of total energy consumption to 49.2 %. Simultaneously, renewable energy and gas — both less GHG-intensive — increased their share in gross inland consumption, rising from 4.3 % to 13.2 % and 17.9 % to 23.3 % between 1990 and 2016, respectively. Despite nuclear phase-out policies in some EU countries, the use of nuclear energy has also increased marginally since 1990, rising from 12.3 % of gross inland consumption to 13.2 % ([23]).

Between 2001 and 2016, GHG intensity of energy consumption in the EU fell by

11.9 %

Climate impacts

Climate impacts refer to climate change-induced changes to environmental, social and economic systems. Three indicators are used for monitoring climate impacts, indirectly providing an indication of trends in terms of climate resilience in the EU: average global and European temperature, ocean acidity and the economic costs that arise as a result of weather- and climate-related disasters.

Continuous increases in near-surface temperatures and ocean acidity over the past decades

All temperature values discussed here refer to near-surface measurements, which are the most relevant to human activity. Historical recordings of the combined global land and marine temperature show a clear upward trend. In the decade from 2008 to 2017, average global near surface temperature was between 0.89 °C and 0.93 °C above pre-industrial levels ([24]). In particular, 2017 was one of the three warmest years ever measured worldwide (together with the years 2015 and 2016), with temperatures between 1.0 °C and 1.1 °C above pre-industrial levels. These data — especially global mean temperatures in the past few years — indicate that roughly half of the warming towards the 2 °C threshold has already occurred ([25]). Warming effects are stronger over land than water, and as a result, warming in the northern hemisphere is more pronounced than in the southern hemisphere ([26]). For this reason, the average annual temperature over the European continent has increased by more than the global average. In Europe, the decade from 2008 to 2017 was the hottest on record with an average temperature between 1.61 °C and 1.71 °C above pre-industrial times. Most recently in 2017, the mean temperature in Europe was between 1.73 °C and 1.81 °C above pre-industrial times ([27]).

Compared with pre-industrial levels, Europe's mean surface temperature increased by

1.73–1.81

degrees Celsius up to 2017

Because oceans act as a reservoir for man-made GHG emissions — also referred to as a carbon sink — ocean acidity is an important indicator of the environmental impacts of climate change. As CO_2 is absorbed into the world's oceans it reduces the pH of the water, resulting in the ocean acidification recorded over the past few decades. In September 2014, the average acidity was calculated as 8.04 pH, which is an unprecedented low over pre-industrial levels of 8.2 and 8.3. Despite considerable annual variability the decline in ocean pH has been consistent (see the chapter on SDG 14 'Life below water' on page 267 for a more detailed discussion).

In September 2014, the mean pH level of ocean water reached a new low of

8.04

The international community, including the EU, has committed to halting the increase in mean global temperature to well below 2 °C above pre-industrial levels and seeks to further limit the increase to 1.5 °C. These objectives were enshrined in the Paris Agreement ([28]) signed at the United Nations Framework Convention on Climate Change (UNFCCC) 21st Conference of the Parties (COP) in 2015.

Economic losses from weather- and climate-related extremes have been considerable over the past decades, accounting for 83 % of monetary losses in EU Member States

While extreme events are only partially due to climate change, statistical attribution studies have shown that various climate extremes in Europe and beyond have become stronger and/or more frequent as a result of global climate change ([29]). Economic or monetary losses refer here to damages caused by climate-related events expressed in euros (2016 values). Between 1980 and 2016 natural disasters caused by weather- and climate-related extremes accounted for about 83 % of the monetary losses in the Member States ([30]). Moreover, over 87 000 casualties were registered over the same period ([31]). However, reported economic losses generally reflect monetised direct damages to certain assets and as such should be considered only partial damage estimates. Losses related to mortality, cultural heritage or ecosystems

Since 2013, the EU Adaptation Strategy ([32]) has encouraged national, regional and local adaptation action within EU borders. Good progress has been achieved so far: 25 Member States now have an Adaptation Strategy (up from 15 in 2013) and the others are working on developing one; climate action has been integrated into EU funding instruments; and adaptation is also now fully integrated in the Covenant of Mayors, with thousands of cities in Europe and worldwide being part of the initiative. A forthcoming evaluation of the EU Strategy on Adaptation to Climate Change will assess its implementation so far and reflect on lessons learnt with a view to further increase the EU's resilience.

The EU has also been at the forefront of international efforts in particular with regards to the adoption of the Paris Agreement ([33]) on climate change and the Sendai Framework for Disaster Risk Reduction ([34]). The EU is highly committed to delivering on the commitments made in Paris ([35]) and supporting work and action to implement the Sendai Framework for Disaster Risk Reduction, finding synergies wherever possible. The EU Action Plan for the Sendai Framework for Disaster Risk Reduction 2015–2030 ([36]) includes climate change adaptation actions carried out at both the EU and international level, linking these to disaster risk reduction strategies and their coherent implementation.

Furthermore, the EU has made disaster and climate resilience a central objective of its humanitarian assistance. The EU Resilience Marker ([37]) is used in all humanitarian projects to define ways to reduce disaster risks and to strengthen people's coping capacities to disasters and crises.

Multiple programmes have been established at the EU level to manage and respond to the risk of natural disaster. For one, the European Union Civil Protection Mechanism ([38]) steps in to aid Member States in a state of emergency due to natural disaster when national capacities are lacking. The European Commission Disaster Risk Management Knowledge Centre (DRMKC) ([39]) and the GIS web-platform Risk Data Hub help enhance resiliency across the EU while also directing policymakers towards more risk-informed decisions.

Finally, the European Climate Change and Adaptation Platform (Climate-ADAPT) ([40]) is an online platform, managed jointly by the European Commission and the European Environment Agency to support Europe in adapting to climate change. It provides access to data and information on: expected climate change in Europe; current and future vulnerability of regions and sectors; European, national and transnational adaptation strategies and actions; adaptation case studies and potential adaptation options; and tools that support adaptation planning.

services are not considered in the estimate; their inclusion would considerably raise the estimate.

Over the period 1980 to 2016, weather- and climate-related economic losses in EU countries accumulated to

EUR 410 billion

Over the period 1980 to 2016, weather- and climate-related losses accounted for a total of EUR 410 billion in losses at 2016 values (over EUR 850 per capita) for Member States. Still, recorded losses vary substantially over time — more than 70 % of the total losses have been caused by just 3 % of disaster events. In contrast, the least damaging three quarters of the registered events were responsible for approximately 0.7 % of the total losses ([41]). This variability makes the analysis of historical trends difficult. Furthermore, the distribution of weather- and climate-related losses across the EU has been historically uneven, ranging from EUR 72 per capita (in Estonia) to EUR 1 868 per capita (in Denmark) in cumulative losses between 1980 and 2016. The most expensive climate extremes in the period in question included the 2002 flood in Central Europe (over EUR 20 billion), the 2003 drought and heat wave (almost EUR 15 billion) and the 2000 extreme precipitation event in France and Italy (EUR 13 billion), all at 2016 values ([42]).

As a first step towards policy action and monitoring weather- and climate-related losses at the European level, a more rigorous scientific procedure is required to record the losses at different European governance levels and allow for the comparison, aggregation and sharing of data. Also, international compatibility, for example with data collected by the UN, should be considered. Currently, there is no standardised mechanism for reporting climate-related losses by Member States to the European Commission or the European Economic Area. However, the Joint Research Centre (JRC) has developed recommendations to improve national databases to help record disaster losses. Once these comparable databases are available for all European Economic Area member countries, there will be a more accurate picture of the costs related to climate change throughout Europe ([44]).

Support to climate action

Climate actions occur at multiple levels of governance in the EU and take various forms, such as policies, economic and strategic planning and financing schemes, among others. At an international level, the EU supports climate investments and initiatives outside of the EU, in particular in the most vulnerable countries, and thus contributes to achieving the USD 100 billion goal set within the auspices of the UNFCCC. The USD 100 billion goal represents a joint effort by developed countries to mobilise finance from various sources for mitigation and adaptation efforts in developing countries. Complementing international and European-level action, the EU also supports the Covenant of Mayors for Climate and Energy, one of the EU flagship climate

The EU is committed to continue mobilising resources to support climate action, both domestically and internationally. Currently, the EU aims to allocate a minimum of 20 % of its budget for the period 2014 to 2020 to climate change action. On 2 May 2018, the European Commission proposed to increase this target to 25 % for the period from 2021 to 2027.

In 2013, the EU launched the Global Climate Change Alliance (GCCA) ([43]), followed in 2015 by the GCCA+, a seven-year thematic flagship programme to help the world's poorest and most climate-vulnerable countries shift to a climate-resilient, low-carbon future. The alliance is a platform for dialogue and exchange of experience between the EU and developing countries and provides technical and financial support for the implementation of climate action.

initiatives. The Covenant of Mayors mobilises local governments and regions to make voluntary but ambitious climate commitments that help achieve the EU emission reduction target and increase the climate resilience of European economies and societies.

At the domestic level, climate change mitigation and adaptation has been integrated into all major EU spending programmes ([45]). Programmes under cohesion policy, agriculture, research and innovation and the Connecting Europe Facility ([46]) currently account for more than 90 % of EU climate-related spending. The sub-programme for climate action under the LIFE programme ([47]) for environment and climate change will provide EUR 864.2 million over the period 2014 to 2020 to develop and implement innovative ways to respond to climate challenges. In addition to the EU budget resources, the NER 300 programme ([48]) provides financing for innovative low-carbon energy demonstration projects.

The EU's contribution to climate finance for developing countries has been increasing since 2014

The EU and its Member States are committed to scaling up the mobilisation of international climate finance, as part of the collective developed countries' goal to jointly mobilise USD 100 billion per year by 2020 through to 2025 for mitigation and adaptation purposes, from a wide variety of sources, instruments and channels ([49]). There are many rules and guidelines for reporting climate finance, with many developed countries following the reporting rules established by the United Nations Framework Convention on Climate Change (UNFCCC) and the Organisations for Economic Co-operation and Development (OECD). At the European level, financing rules are laid down in Article 16 of the Monitoring Mechanism Regulation (MMR), which closely follow rules agreed under UNFCCC ([50])([51]).

In 2016, the EU contribution to the international USD 100 billion commitment amounted to

EUR 20.2 billion

Total EU contributions towards the USD 100 billion per year goal increased from about EUR 14.5 billion in 2014 to EUR 20.2 billion in 2016 — a 39.2 % increase in two years. EU contributions vary significantly by Member State. The largest contributor to the international commitment in both 2014 and 2016 was Germany, with contributions increasing from EUR 5.1 billion to EUR 8.5 billion, followed by France (see Figure 13.10). The European Commission and the European Investment Bank (EIB) were the third and fourth largest donors in 2016, respectively.

The number of signatories to the Covenant of Mayors is growing, with more than a third of the EU population represented by signatory authorities in 2018

The Covenant of Mayors for Climate and Energy, established in 2008, is an initiative for voluntary cooperation and coordination on climate action by local and regional authorities ([52]). While initially focusing on mitigation measures only, from 2017 onwards the Covenant of Mayors for Climate and Energy has explicitly concentrated on both mitigation and adaptation measures to promote an integrated approach to climate and energy action ([53]). Local governments commit to implementing the EU's climate and energy objectives by taking steps to curb GHG emissions, adapt to and mitigate climate impacts and secure sustainable and affordable energy within their jurisdictions. The Covenant of Mayors is mentioned in various EU Directives and strategy papers, such as the Energy Union Package ([54]), the Energy Security Strategy ([55]) and the Energy Efficiency Directive ([56]), as an important platform to deliver on strategic objectives targeted in those

198 million people in the EU were living in municipalities that were signatories to the Covenant of Mayors for Climate and Energy by June 2018

documents. Signatories' objectives encompass various energy-related ends, such as the energy efficiency of buildings, energy security and renewable energy use.

By joining the Covenant of Mayors, participants in the past committed to submitting a Sustainable Energy Action Plan (SEAP) to the European Commission, including a baseline emission inventory, a GHG emission target for 2020 and planned actions to reach the target. Under the new Covenant of Mayors, signatories commit to deliver integrated Sustainable Energy and Climate Action Plans (SECAPs) instead of the SEAPs, as demanded in the Clean Energy for All Europeans package ([57]). The new SECAPs include an obligation to pursue adaptation actions in addition to mitigation measures. Furthermore, signatories must set up a biennial monitoring process to measure progress towards their targets. Various actors at different levels of governance — including provinces, regions, ministries, metropolitan areas and groupings of local authorities — are eligible to become signatories. Since 2017, the reach of the initiative has increased beyond European borders, within the context of the Global Covenant of Mayors for Climate and Energy.

By June 2018, Covenant of Mayors signatories represented 198 million inhabitants within the EU. Italy had the highest number of signatories at the start of 2018 with 4 012, representing 45.0 million inhabitants, followed by Spain with 1 826 signatories representing 30.0 million inhabitants. Both countries together accounted for 79.1 % of signatories and roughly 38.0 % of the represented population within the EU. Naturally, the size of participating signatories differs. While many signatories in Italy and Spain are small municipalities, other countries have fewer but larger signatories. Germany, for example, only had 72 signatories at the start of 2018, but these represented 18.8 million people. Similarly, the United Kingdom had only 36 signatories, which still represented 20.9 million inhabitants. These figures are largely determined by the participation of the largest cities in these countries, Berlin and London. In 2017, Belgium had the highest share of population covered by the Covenant of Mayors, followed by Italy and Spain ([58]).

Currently, 891 signatories in 25 countries include adaptation commitments, covering 60.5 million inhabitants in the EU ([59]). Although the inclusion of adaptation in signatories' SECAPs is relatively new, the difference between the overall number of signatories and those that cover adaptation suggests that progress on adaptation lags behind mitigation.

Presentation of the main indicators

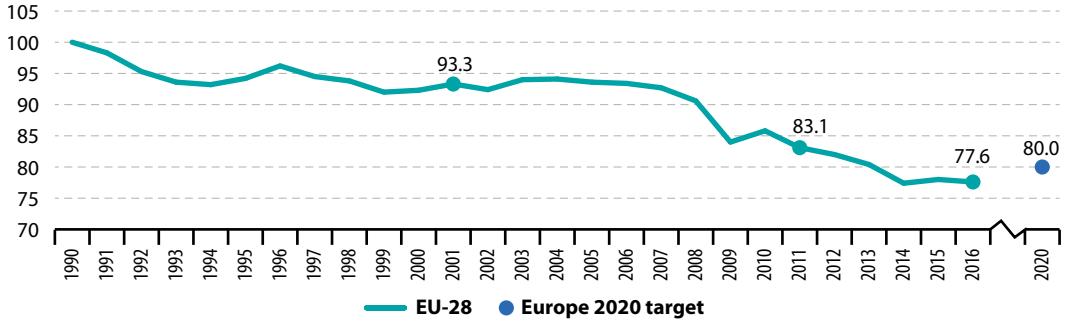
Greenhouse gas emissions

LONG TERM 2001–2016

SHORT TERM 2011–2016

This indicator measures man-made emissions of the so-called 'Kyoto basket' of greenhouse gases (GHG) ([60]), which are integrated into a single indicator expressed in units of CO_2 equivalents using each gas's global warming potential (GWP). Emissions data are submitted annually by Member States to the United Nations Framework Convention on Climate Change (UNFCCC) and published by Eurostat based on data from the European Environment Agency (EEA).

Figure 13.1: Greenhouse gas emissions, EU-28, 1990–2016
(Index 1990 = 100)

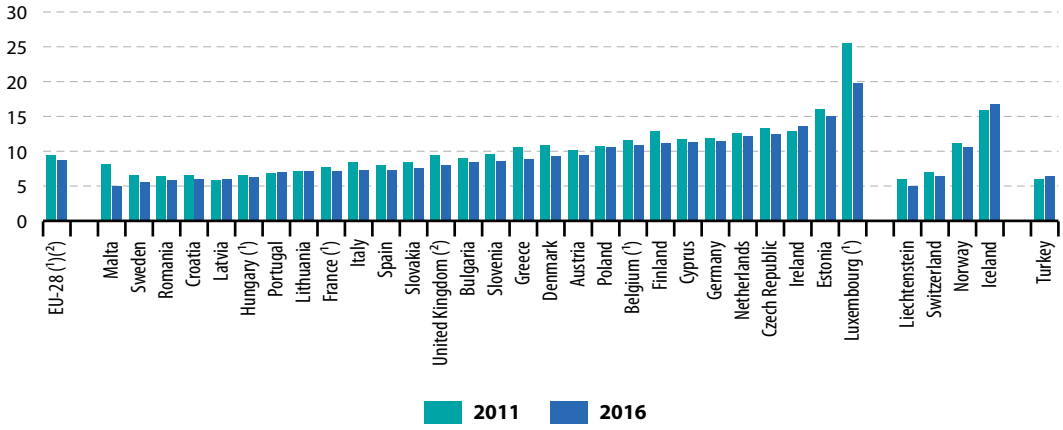


Note: Total emissions, including international aviation and indirect CO_2, but excluding emissions from land use, land use change, and forestry (LULUCF).

Source: EEA, Eurostat (online data code: sdg_13_10)

As seen in Figure 13.1, by 2016, the EU as a whole cut GHG emissions by 22.4% compared to 1990 levels. The EU is thus on track to reach the 2020 emissions reduction target. This trajectory amounts to a long-term average decrease of 1.2% per year in the period 2001 to 2016, which accelerated to 1.4% per year between 2011 and 2016.

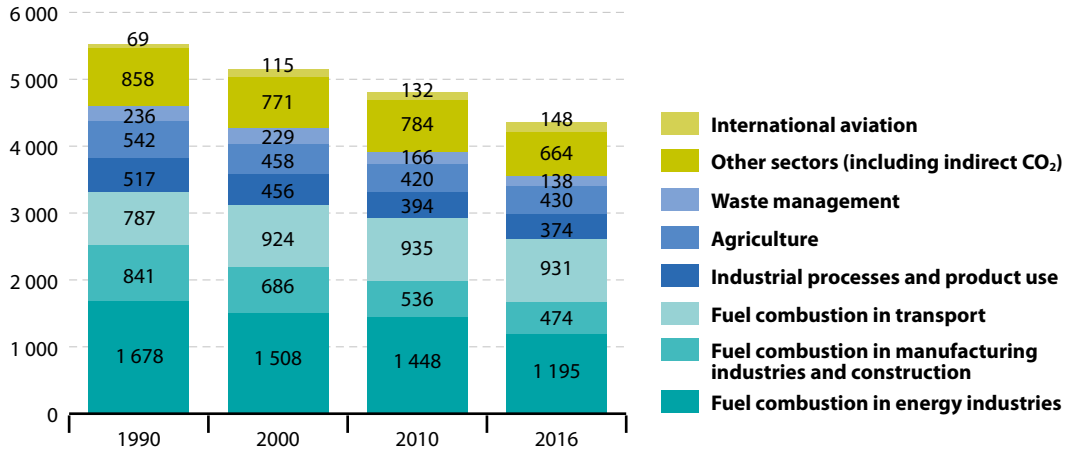
Figure 13.2: Greenhouse gas emissions per capita, by country, 2011 and 2016
(tonnes per capita)



Note: Total emissions, including international aviation and indirect CO_2, but excluding emissions from land use, land use change, and forestry (LULUCF).
(1) Break(s) in time series between 2011 and 2016.
(2) 2016 data are provisional and/or estimates.

Source: EEA, Eurostat (online data code: sdg_13_10)

Figure 13.3: Greenhouse gas emissions by sector, EU-28, 1990, 2000, 2010 and 2016
(million tonnes of CO_2 equivalent)



Source: EEA, Eurostat (online data code: env_air_gge)

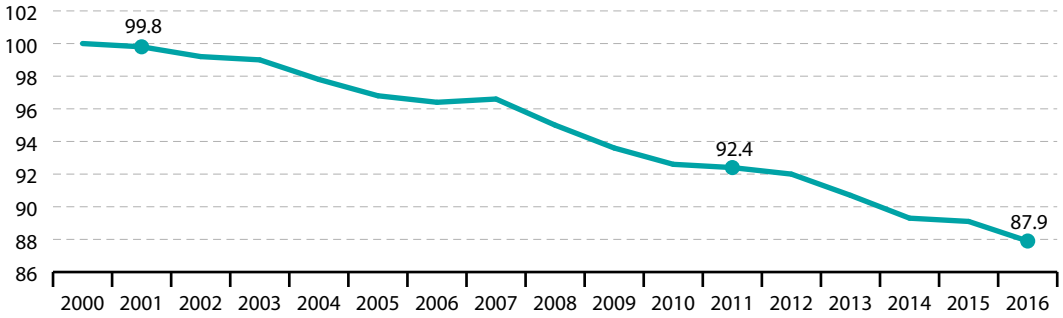
Greenhouse gas emissions intensity of energy consumption

LONG TERM 2001–2016

SHORT TERM 2011–2016

The GHG intensity of energy consumption is the ratio between energy-related GHG emissions and gross inland consumption of energy. It expresses how many tonnes of CO_2 equivalent of energy-related GHGs are emitted in a certain economy per unit of energy consumed. The data on energy emissions are sourced from the GHG emissions reported to the UNFCCC. Gross inland consumption is reported by each Member State to Eurostat and is the sum of final energy consumption, distribution losses, transformation losses and statistical differences.

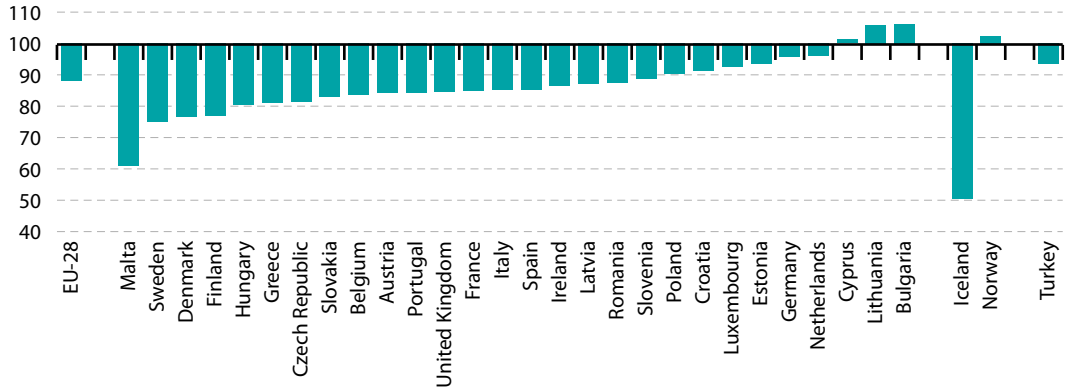
Figure 13.4: Greenhouse gas emissions intensity of energy consumption, EU-28, 2000–2016
(Index 2000 = 100)



Source: EEA, Eurostat (online data code: sdg_13_20)

Across the EU, GHG emissions intensity of energy consumption between 2000 and 2016 decreased by 12.1 % with considerable variation by country. The average annual fall amounted to 0.8 % in the long- and 1.0 % in the short-term period (since 2001 and 2011, respectively).

Figure 13.5: Greenhouse gas emission intensity of energy consumption, by country, 2016
(Index 2000 = 100)



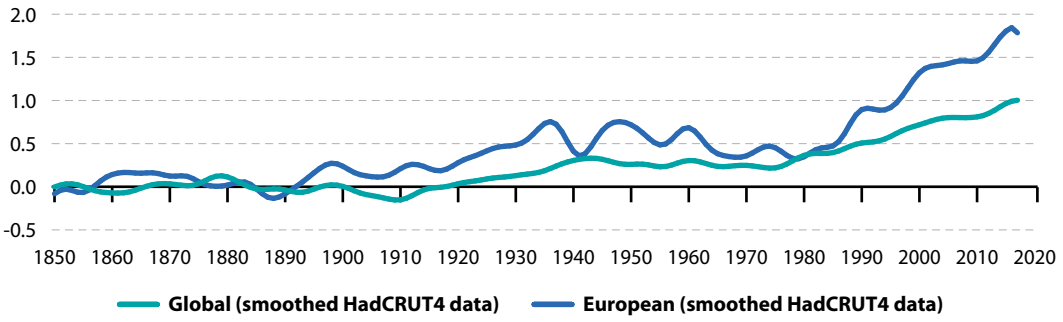
Source: EEA, Eurostat (online data code: sdg_13_20)

X Indication of progress not possible

Mean near surface temperature deviation

This indicator tracks deviations in average near surface temperature worldwide and for Europe compared with the 1850 to 1899 average. These measurements have been taken for decades by a dense network of stations across the globe. The data are monitored using standardised measurements, and quality control and homogeneity procedures are used to ensure data are compatible and comparable. The average annual temperature shown here is expressed in relation to the 'pre-industrial' baseline period of 1850 to 1899, when widespread temperature measurement was first established ([61]). Data presented in this section stem from the EEA, based on the Met Office Hadley Centre and Climatic Research Unit (HadCRUT4).

Figure 13.6: Global and European annual mean temperature deviations, 1850–2017
(temperature deviation in °C, compared to 1850–1899 average)



Source: EEA, Eurostat (online data code: sdg_13_30)

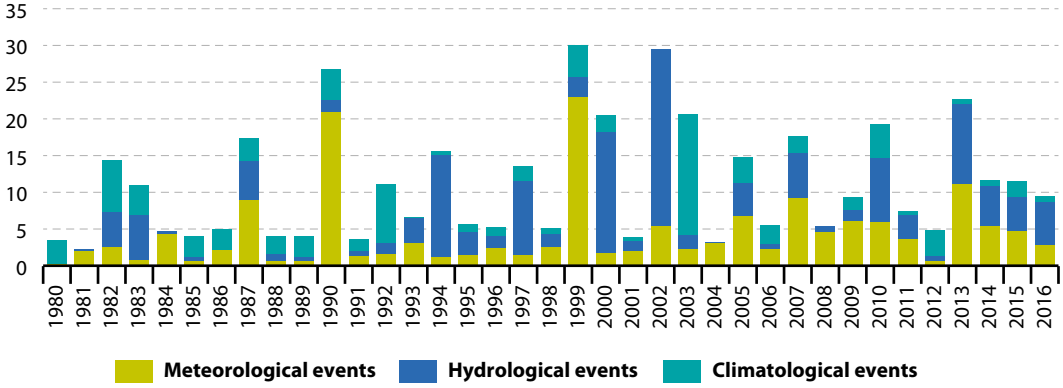
Over the ten-year period from 2008 to 2017, global near surface temperature was on average 0.89 °C above pre-industrial levels. The year 2017 was one of the three warmest years ever measured worldwide (together with the years 2015 and 2016), with temperatures between 1.0 °C and 1.1 °C above pre-industrial levels. These data indicate that almost half of the warming towards the two degrees (2 °C) threshold has already occurred.

Climate-related economic losses

X Indication of progress not possible

This indicator includes the overall losses from weather- and climate-related disasters. It is based on data from the NatCatSERVICE managed by Munich Reinsurance Company ([62]). The NatCatSERVICE is a global database of natural catastrophe data around the world, collected since 1974.

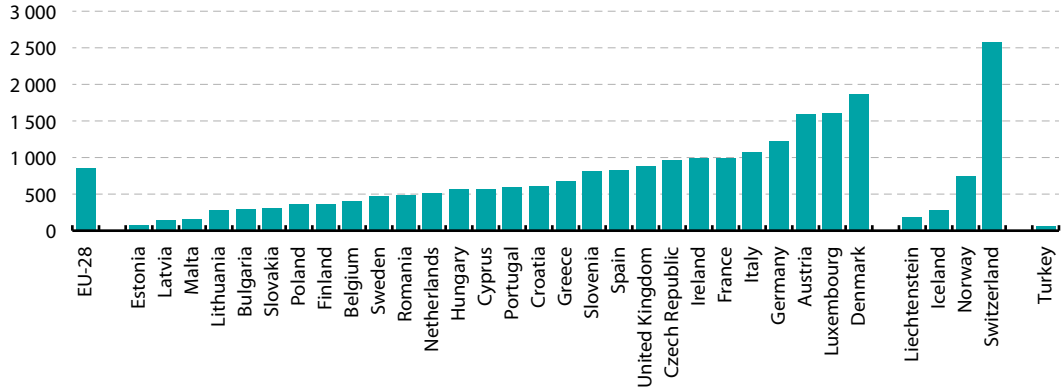
Figure 13.7: Climate related economic losses by type of event, EU-28, 1980–2016
(EUR billion, in 2016 values)



Source: EEA, Eurostat (online data code: sdg_13_40)

Climate-related losses have fluctuated substantially from year to year with extremes marked by particularly damaging events such as the 2000 extreme precipitation event in France and Italy (EUR 13 billion), the 2002 flood in central Europe (over EUR 20 billion) and the 2003 drought and heat wave (almost EUR 15 billion), all at 2016 values ([63]). Annual variability makes it difficult to assess any trend. Furthermore, because there have been fewer singularly damaging events in recent years, any calculation of a trend would be misleading, as low disaster costs in the short term cannot be used as an indicator of future occurrences.

Figure 13.8: Economic losses from climate-related extremes, by country, 1980–2016
(cumulative losses in EUR per capita, in 2016 values)



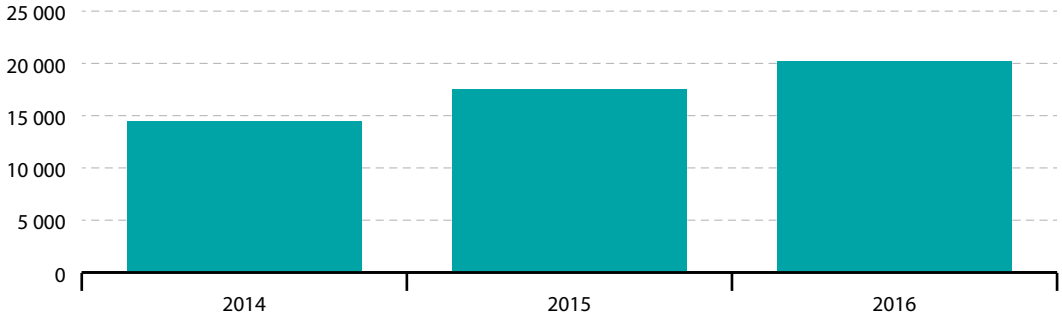
Source: EEA, Eurostat (online data code: sdg_13_40)

X Indication of progress not possible

Contribution to the international USD 100bn commitment on climate-related expending

The intention of the international commitment on climate finance under the UNFCCC is to enable and support enhanced action by developing countries to advance low emission and climate resilient development. The data presented in this section are reported under the Monitoring Mechanism Regulation (MMR) to the European Commission.

Figure 13.9: Contribution to the international USD 100bn commitment on climate-related expending, EU-28, 2014–2016
(EUR million, current prices)



Note: Data for EU-28 include the European Commission (EC), the European Investment Bank (EIB) and the 28 Member States.
Source: European Commission services and EIONET (online data code: sdg_13_50)

As seen in Figure 13.9, the EU contribution towards the goal of USD 100 billion per year increased from around EUR 14.5 billion in 2014 to EUR 20.2 billion in 2016. These numbers include financial flows from all Member States, as well as funds from the European Commission (EC) and the European Investment Bank (EIB).

Table 13.3: Contribution to the international USD 100bn commitment on climate-related expending, by country, 2014 and 2016
(EUR million, current prices)

Country	2014	2016
EU-28	**11 718.4**	**15 501.4**
EC	**677.0**	**2 730.2**
EIB	**2 098.5**	**1 947.7**
Belgium	142.7	100.9
Bulgaria (1)	0.1	0.1
Czech Republic	10.8	7.5
Denmark	222.0	173.0
Germany	5 130.6	8 534.1
Estonia	0.5	0.4
Ireland	41.4	52.7
Greece	0.0	0.2
Spain	498.8	595.0
France	2 921.4	3 334.8
Croatia	0.0	:
Italy	143.2	243.0
Cyprus	0.0	:
Latvia	0.4	0.0
Lithuania	0.3	0.5
Luxembourg	36.3	129.5
Hungary	2.7	35.3
Malta	0.1	0.2
Netherlands	340.0	471.9
Austria	141.3	199.3
Poland	4.2	5.4
Portugal	9.5	2.0
Romania	0.0	0.8
Slovenia	2.4	3.0
Slovakia	1.2	3.0
Finland	132.3	43.0
Sweden	384.8	402.4
United Kingdom	1 551.4	1 163.6

(1) 2015 data (instead of 2016).

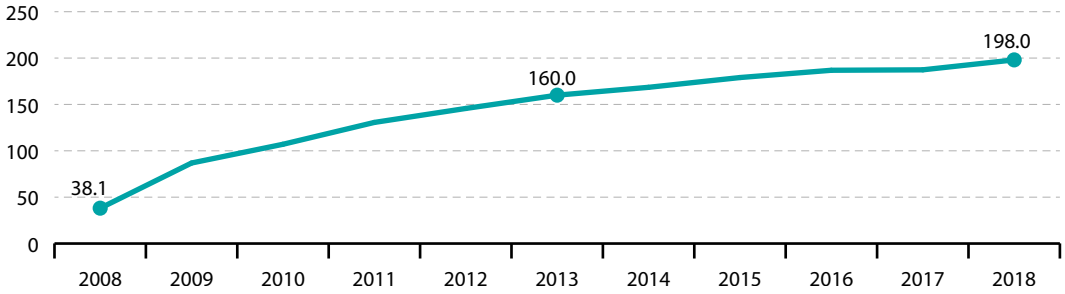
Source: European Commission services and EIONET (online data code: sdg_13_50)

X Indication of progress not possible

Population covered by the Covenant of Mayors for Climate and Energy signatories

The Covenant of Mayors for Climate and Energy in Europe, now part of the Global Covenant of Mayors for Climate and Energy, represents a growing climate initiative at multiple levels of governance with actors all across the globe pledging to deliver comprehensive climate change mitigation and adaptation and energy action plans and establish a regular monitoring process. Here the number of citizens living within regions that act as signatories to the Covenant of Mayors in Europe is monitored as an indication of the initiative's reach.

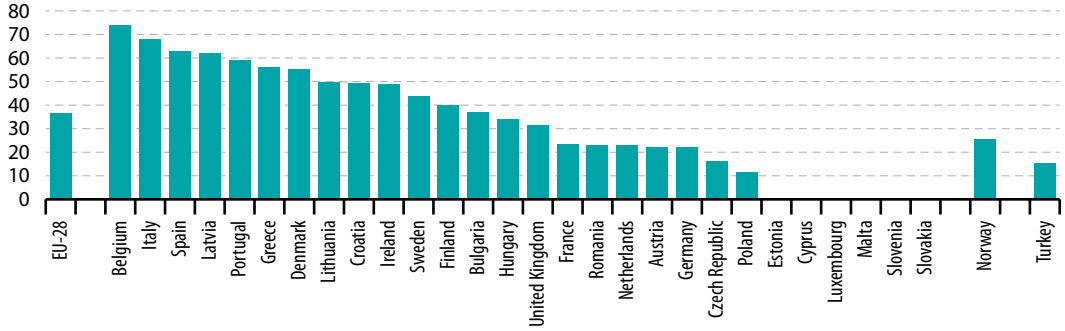
Figure 13.10: Population covered by the Covenant of Mayors for Climate and Energy signatories, EU-28, 2008–2018
(million people)



Note: 2017 data are up to April 2017; 2018 are up to June 2018; data exclude signatories put 'on hold'.
Source: Covenant of Mayors for Climate & Energy (online data code: sdg_13_60)

According to data from the Covenant of Mayors office, 7 383 active authorities out of the 7 755 who had signed by the beginning of 2018 were from the EU. In the first half of 2018, signatories represented about 198.0 million inhabitants in the EU — an increase of 38.0 million within five years.

Figure 13.11: Population covered by the Covenant of Mayors for Climate & Energy signatories, by country, 2017
(% of population)



Note: provisional and/or estimated data for many countries.
Source: Covenant of Mayors for Climate & Energy (online data code: sdg_13_60)

Further reading on climate action

European Environment Agency (2017), *Analysis of key trends and drivers in greenhouse gas emissions in the EU between 1990 and 2015*, Report No. 8/2017, Copenhagen, EEA.

European Environment Agency (2017), *Climate change, impacts and vulnerability in Europe 2016 — An indicator-based report*, Report No. 1/2017, Copenhagen, EEA.

European Environment Agency (2017), *Trends and projections in Europe 2017 — Tracking progress towards Europe's climate and energy targets*, Report No. 17/2017, Copenhagen: EEA.

European Commission (2017), *Climate Action*.

Eurostat (2016), *Smarter, greener, more inclusive? Indicators to support the Europe 2020 Strategy, 2016 Edition*, Luxembourg, Publications Office of the European Union.

Intergovernmental Panel on Climate Change (2014), *Climate Change 2014: Synthesis Report. Contribution of Working Group I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge; New York, Cambridge University Press.

Oxfam (2016), *Climate finance shadow report 2016*, Oxford, Oxfam International.

Further data sources on climate action

European Environment Agency, Greenhouse gas data viewer.

European Environment Agency, Global and European temperature.

Eurostat, Climate change.

Eurostat, Statistics Explained: Climate change — Driving forces.

Eurostat, Europe 2020 indicators — Climate change and energy.

Eurostat, Statistics Explained: Greenhouse gas emission statistics — Air emissions accounts.

Eurostat, Statistics Explained: Greenhouse gas emission statistics — Emission inventories.

Notes

(1) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
(2) European Environment Agency (2017), *Analysis of key trends and drivers in greenhouse gas emissions in the EU between 1990 and 2015, Report No. 8/2017*, Copenhagen, EEA.
(3) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
(4) European Council (2014), *European Council (23 and 24 October 2014) — Conclusions*, EUCO 169/14, Brussels.
(5) Council of the European Union (2018), *Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources — Analysis of the final compromise text with a view to agreement*, 10308/18 COR 1, Brussels.
(6) European Commission (2015), *A framework strategy for a resilient Energy Union with a forward-looking climate change policy*, COM(2015) 80 final, Brussels.
(7) European Commission (2015), *European structural and investment funds 2014–2020: Official texts and commentaries*, Brussels.
(8) European Environment Agency (2018), *Annual European Union greenhouse gas inventory 1990–2016 and inventory report 2018, Report No. 5/2018*, Copenhagen: EEA, p. iv.
(9) Source: Eurostat (online data code: t2020_31).
(10) Eurostat (2017), Statistics Explained: Climate change — Driving forces.
(11) European Environment Agency (2017), *Trends and projections in Europe 2017 — Tracking progress towards Europe's climate and energy targets*, Report No. 17/2017, Copenhagen, EEA; and European Environment Agency (2017), *Analysis of key trends and drivers in greenhouse gas emissions in the EU between 1990 and 2015*, Report No. 8/2017, Copenhagen, EEA.
(12) Eurostat, Primary energy consumption (online data code: sdg_07_10); Eurostat, Final energy consumption (online data code: sdg_07_11).
(13) Source: Eurostat (online data code: nrg_ind_335a).
(14) Odyssee-Mure (2015), *Trends and policies for energy savings and emissions in transport*.
(15) European Commission (2016), *A European strategy for low-emission mobility*, COM(2016) 501 final, Brussels.
(16) European Commission (2016), *Accelerating clean energy innovation*, COM(2016) 763 final, Brussels.
(17) European Parliament and Council of the European Union (2009), Directive 2009/30/EC amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC.
(18) European Parliament and Council of the European Union (2014), Regulation (EU) No 333/2014 amending Regulation (EC) No 443/2009 to define the modalities for reaching the 2020 target to reduce CO2 emissions from new passenger cars.
(19) European Commission (2017), *Proposal for a regulation of the European Parliament and of the Council setting emission performance standards for new passenger cars and for new light commercial vehicles as part of the Union's integrated approach to reduce CO_2 emissions from light-duty vehicles and amending Regulation (EC) No 715/2007*, COM(2017) 676 final, Brussels.
(20) European Commission (2018), *Proposal for a regulation of the European Parliament and of the Council setting CO_2 emission performance standards for new heavy-duty vehicles*, COM(2018) 284 final, Brussels.
(21) European Commission (2016), *A European strategy for low-emission mobility*, COM(2016) 501 final, Brussels.
(22) Eurostat (2010), *Using official statistics to calculate greenhouse gas emissions — A Statistical Guide*, Luxembourg, Publications Office of the European Union.
(23) Source: Eurostat (online data code: nrg_100a); all calculations are in tonnes of oil equivalent (TOE).
(24) Please note that these ranges refer to three different data sets (NOAA, GISSTEMP and HadCRUT) included in table sdg_13_30, whereas Figure 13.6 and the respective analysis refer to the HadCRUT dataset only.
(25) European Environment Agency (2018), Global and European temperature.
(26) Friedman, A. R., Y.-T. Hwang, J. C. H. Chiang, and D. M. W. Frierson (2013), Interhemispheric temperature asymmetry over the twentieth century and in future projections, *J. Climate*, 26, 5419–5433.
(27) European Environment Agency (2018), Global and European temperature.
(28) United Nations (2015), *Paris Agreement*.
(29) Intergovernmental Panel on Climate Change (2012), *Managing the risks of extreme events and disasters to advance climate change adaptation*, Special Report of the Intergovernmental Panel on Climate Change, Cambridge; New York, Cambridge University Press.
(30) European Environment Agency (2018), *Economic losses from climate-related extremes*.
(31) Ibid.
(32) European Commission (2013), *An EU strategy on adaptation to climate change*, COM (2013) 216 final, Brussels.
(33) United Nations (2015), *Paris Agreement*.
(34) United Nations Office for Disaster Risk Reduction (2015), Sendai Framework for Disaster Risk Reduction 2015–2030.
(35) European Commission (2017), *Report from the Commission to the European Parliament and the Council. Two years after Paris — progress towards meeting the EU's climate commitments*, COM(2017) 646 final, Brussels.
(36) European Commission (2016), *Action plan on the Sendai Framework for Disaster Risk Reduction 2015–2030 — A disaster risk-informed approach for all EU policies*, SWD(2016) 205 final/2, Brussels.
(37) European Commission (2014), *Resilience marker — General Guidance*.

(38) European Commission (2017), *Strengthening EU disaster management: rescEU solidarity with responsibility*, COM(2017) 773 final, Brussels.
(39) European Commission, Disaster risk management knowledge centre.
(40) European Commission, European climate adaptation platform.
(41) European Environment Agency (2018), *Economic losses from climate-related extremes*.
(42) Ibid.
(43) European Commission, Global Climate Change Alliance (GCCA).
(44) Joint Research Centre (2018), *Loss database architecture for disaster risk management*, Luxembourg, Publications Office of the European Union.
(45) European Commission, Budget — Multiannual Financial Framework programmes.
(46) European Commission, Connecting Europe Facility.
(47) European Commission, LIFE programme.
(48) European Commission, NER 300 programme.
(49) European Commission (2018), *A modern budget for a Union that protects, empowers and defends: The Multiannual Financial Framework for 2021–2027*, COM(2018) 321 final, Brussels.
(50) European Parliament and Council of the European Union (2013), Regulation (EU) No 525/2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC.
(51) European Environment Agency (2017), *EIONET reporting obligations database — Reporting obligation for: Financial and technology support provided to developing countries*.
(52) Covenant of Mayors for Climate and Energy.
(53) European Commission, European climate adaptation platform — Covenant of Mayors for Climate and Energy.
(54) European Commission (2015), *A framework strategy for a resilient Energy Union with a forward-looking climate change policy*, COM(2015) 80 final, Brussels.
(55) European Commission (2014), *European Energy Security Strategy*, COM(2014) 330 final, Brussels.
(56) European Parliament and Council of the European Union (2012), Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.
(57) European Commission (2016), *Commission proposes new rules for consumer centred clean energy transition*.
(58) Covenant of Mayors for Climate and Energy, The Covenant in figures.
(59) Ibid.
(60) The 'Kyoto basket' of GHGs includes carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and the so-called F-gases, i.e., hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride (NF_3) and sulphur hexafluoride (SF_6).
(61) European Environment Agency (2018), *Global and European temperature*.
(62) Munich RE, NatCatSERVICE.
(63) European Environment Agency (2018), *Economic losses from climate-related extremes*.

14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 14 aims to protect and ensure the sustainable use of oceans by implementing international law as reflected in the United Nations Convention on the Law of the Sea (UNCLOS). This includes the safeguarding of marine and coastal ecosystems, conserving marine and coastal areas, reducing marine pollution and the impacts of ocean acidification, and ending overfishing.

eurostat
supports the SDGs

EU Member States share four main marine regions: the Baltic Sea, the Mediterranean Sea, the Black Sea and the North-East Atlantic ocean. While the specific threats may vary between sea basins, it is clear that habitat alteration, overfishing and pollution are the most important general pressures affecting the environmental status of EU marine waters. At the same time, the livelihood and well-being of Europeans are heavily dependent on the productivity and health of marine ecosystems. To combat the loss of biodiversity and ensure sustainable ecosystems, the EU implements measures to conserve marine areas. Through its policies, the EU also promotes sustainable fisheries and addresses pollution to protect the health and productivity of the oceans. Ocean acidification is addressed through climate and energy policies.

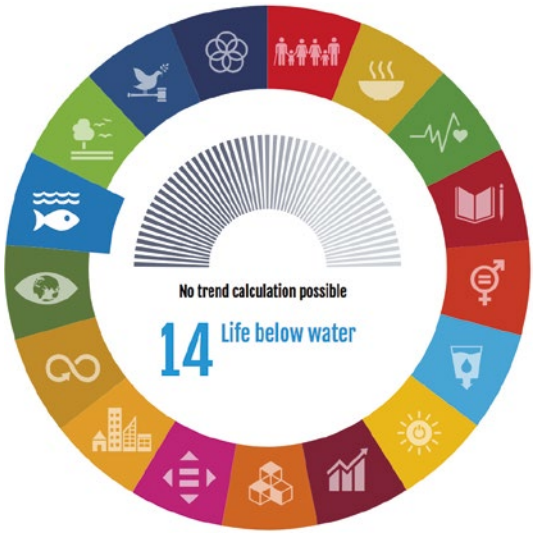


Table 14.1: Indicators measuring progress towards SDG 14, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Marine conservation			
Surface of marine sites designated under Natura 2000	:	↑ (1)	page 268
Sustainable fisheries			
Estimated trends in fish stock biomass	:	:	page 269
Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (F_{MSY})	:	:	page 270
Ocean health			
Seawater bathing sites with excellent water quality	:	↗	page 271
Mean ocean acidity	:	:	page 272

(1) Trend refers to EU-27.

Table 14.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
🎯	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Life below water in the EU: overview and key trends

Monitoring SDG 14 in an EU context looks into developments in the areas of marine conservation, sustainable fisheries and ocean health. As indicated in Table 14.1, the lack of data or the limited scope of the available indicators makes it difficult to assess whether the EU has made progress in these areas over the past 15 years.

Marine conservation

European citizens depend in many ways on the services that marine ecosystems provide, including fish and seafood, coastal protection, degradation of pollutants and climate regulation. In addition, the marine environment offers recreation and tourism opportunities. The European Commission and Member States have taken multiple steps to combat the loss of aquatic habitats and biodiversity, which poses a serious threat to human livelihoods, food security and climate stability ([1]). A crucial step in terms of the protection of habitats and biodiversity has been the designation of a network of marine protected areas (MPAs) ([2]), in which human activities are subject to stricter regulation. The degree of protection varies and depends on the management plan regulating the protected area. Management measures range from a strict ban on any type of economic activity, such as fishing, mining or wind power generation, to a more moderate protection regime where only certain types of fishing methods are allowed, and/or any other economic development is handled in a restrictive way. The EU currently has no overview or assessment of the management plans and their effectiveness associated with the MPAs designated in EU regional seas.

The extent of marine protected areas has been increasing in the EU

In 2016, marine protected areas in the EU were to a large extent formed by the Natura 2000 network (54 %), and complemented by nationally designated marine protected areas that are established under each Member State's national framework (46 %) ([3]). The Natura 2000 network comprises protected areas under the EU Habitats and Birds Directives, which have the goal to maintain or restore a favourable conservation status of the natural habitat types and species for which the area was designated. Current data and trends on the development of the sites declared under Natura

In 2017, the spatial extent of marine protected areas under Natura 2000 in the EU reached

532 417 km²

The Birds ([4]) and Habitats Directives ([5]) make a substantial contribution to the implementation of the EU Biodiversity Strategy to 2020 ([6]) in the marine environment by promoting the protection, conservation and restoration of key marine habitats and species in European marine waters. The Marine Strategy Framework Directive fosters the designation of marine protected areas by requiring Member States to include spatial protection measures in their Programmes of Measures ([7]). The protection of the marine environment also constitutes a key objective under the Maritime Spatial Planning Directive ([8]). On top of this, the EU is also actively preparing for the negotiation of an international legally binding instrument on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ) under the United Nations Convention on the Law of the Sea ([9]).

2000 show a clear increase in marine protected areas in the EU. In 2017, the spatial extent of marine sites designated for the Natura 2000 network was five times the size of the designated area in 2008, having increased from 92 894 km^2 to 532 417 km^2.

The target for the spatial extent of protected areas in the EU is set by the EU Biodiversity Strategy 2020 and the Aichi Targets in the global Strategic Plan for Biodiversity 2011–2020 ([10]) under the Convention of Biological Diversity (CBD). By being a signatory partner to the CBD, the EU and individual Member States have agreed to adhere to the Aichi target 11, according to which 10 % of marine and coastal areas have to be conserved by 2020. In 2012, the coverage of marine protected areas in the EU amounted to only 5.9 % of the total marine and coastal surface area ([11]). However, considering the increase in the marine protected areas in the EU, it is likely that this share has increased since 2012 and the EU has moved closer to meeting the 10 % target.

Compared to land-based protected areas, there were significant delays in the establishment of marine protected areas in the Natura 2000 network until 2013. Since then, a sharp increase has taken place, as marine protected areas have climbed up political agendas and research efforts have accelerated, including through EU financial support.

The spatial extent of marine protected areas shows strong regional variations

The coverage of marine protected areas varies strongly across regional seas, and there is a clear variation between different countries. In 2012, only the Baltic Sea (13.5 % MPA coverage) had reached the 10 % Aichi target, followed by the Mediterranean Sea with 9.5 %. In contrast, the Black Sea had only designated 4.5 % and in the EU part of the North-East Atlantic ocean, only 4.2 % were designated ([12]). Furthermore, significant differences occur between near shore and coastal waters, where MPA coverage can exceed 75 %, and offshore waters, where MPA coverage can be close to zero.

The conservation status of marine habitats and species remains unfavourable

It should be pointed out, however, that the extent of protected areas alone does not provide a good indication on the effectiveness of the protection of species and habitats, without further information on the status and implementation of conservation measures. Scarcity of marine data limits the conclusions that can be drawn in this respect, but the data that are available indicate that in 2012 the conservation status of marine habitats and species was still unfavourable in most cases.

This is illustrated by the latest European Environment Agency (EEA) analysis of the conservation status of marine habitats, carried out in 2016 with data from the 2007 to 2012 reporting period of the Birds and Habitats Directives. Based on a limited number of assessments (six to eight per marine region) in the North-East Atlantic, none of the habitats had a favourable conservation status, while the share of unfavourable but improving marine habitats was relatively high, with 43 %. For 29 % of the assessed habitats the status remained unknown. In the Baltic region, none of the habitats assessed had a favourable status and 71 % had an unfavourable and declining status ([13]).

Similar to the situation with marine habitats, the data on the status of marine species protected by the Habitats Directive are too scarce to draw any general conclusion from. The latest assessment was conducted by the EEA in 2016 and is based on data from the 2007 to 2012 reporting period. The limited number of species assessments per marine region (ranging from three to 48) indicates that the conservation status of the large majority of species was unfavourable or unknown in all marine regions, with the exception of the Baltic region, where, however, only three species assessments were conducted ([14]).

Sustainable fisheries

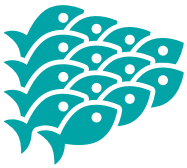
The unsustainable use of living resources, next to pollution, is the main threat to marine habitats and species in the EU ([15]), so the prudent management

of the fishing activities of the European fleet also has important implications for biodiversity conservation.

Governance of fisheries in EU waters mainly focuses on fair access and sustainable supply. Management efforts are channelled through the European Common Fisheries Policy (CFP), which limits the total amount of fish catches, controls who is allowed to fish, as well as how, when and where, with a view to preventing damage to vulnerable marine ecosystems and preserving fish stocks. The ambition and implementation of the CFP will have a direct bearing on reaching SDG 14, which includes the aim of ending overfishing, the destructive and/or illegal, unreported and unregulated fishing practices, and the subsidies that incentivise these activities.

Improvements for the sustainability of fisheries in the North-East Atlantic

European fisheries affect fish stock productivity and stock size through catches. A fish stock is a group of fish from the same species that live in the same geographical area and mix enough to breed with each other when mature. Stock size is subject to natural variability that can overwhelm the influence of fishing from one year to the next. Fisheries management cannot directly control stock size; the only variable that can be directly controlled is fishing mortality. Fishing mortality (F) is a measure of fishing pressure that monitors the proportion of fish of a given age that is taken by fisheries during one year. For fisheries to be sustainable, fishing mortality should not exceed the maximum sustainable yield (MSY) — the point at which the largest catch can be taken from a fish stock over an indefinite period without harming it ([16]). Thus, MSY is not a target to aim for, but rather a limit to stay well clear of in order for fisheries to be sustainable.



43.9 % of assessed stocks in the North-East Atlantic were overfished in 2016

There has been a positive improvement in the number of stocks fished at maximum sustainable yield (F_{MSY}) in the North-East Atlantic, where around three-quarters of the EU's catch originates. In 2003, only about 30 % of stocks in this region were fished at F_{MSY}, whereas in 2016, this figure had risen to 56 % ([17]).

The model-based mean value of all F/F_{MSY} assessments can be used as an additional tool to indicate fishing pressures on fish stocks. Values above 1.0 mean that the current fishing mortality (F) exceeds the estimated F_{MSY}. The results for the North-East Atlantic mirror the downward trend in overexploited stocks, and show a reduction in pressure from 1.6 to 0.9 between 2003 and 2016. This means that overall stocks are on average fished sustainably in this region.

Between 2003 and 2016, fish stock biomass in the North-East Atlantic increased by 39.0 %

The EU's approach to sustainable fisheries is not limited to achieving MSY. The Marine Strategy Framework Directive (MSFD) ([18]) requires that commercially exploited fish and shellfish populations have a healthy distribution of age and size. Positive reductions in fishing mortality can lead to increases in stock size, and the status of stocks and their reproductive capacity can be measured and described by fish stock biomass as well as by spawning stock biomass (SSB). Biomass estimates are associated with high levels of uncertainty due to the fact that stock biomass can vary substantially from one year to the next. In addition, fish stocks can take considerable time to respond to changes in management measures and results can be masked by other factors, such as environmental conditions and predation ([19]). For this reason, analysis of stock biomass trends should always focus on longer term patterns. In the case of the North-East Atlantic and adjacent seas, the reports of reproductive capacity (MSY Btrigger) are currently within policy thresholds, and there has been an estimated 39 % increase in biomass for the North-East Atlantic between the years 2003 and 2016. Furthermore, considering that unsustainable

fisheries are identified as a major threat to marine ecosystems ([20]), additional measures to regulate fisheries are required under the Birds and Habitats Directives. The CFP empowers Members States and the Commission to adopt such measures in order to fulfil obligations under these directives and the MSFD.

The Common Fisheries Policy (CFP) ([21]) aims to ensure the long-term sustainability of the sector by safeguarding stock reproduction for high long-term yield, improving distribution of fishing opportunities, conserving marine resources and supporting the profitability of the industry. The Marine Strategy Framework Directive (MSFD) ([22]) takes a comprehensive and integrated approach to the protection of the marine environment and natural resources with the aim of achieving good environmental status of EU marine waters that are ecologically diverse, clean, healthy and productive by 2020.

Fisheries in the Mediterranean and Black Seas face greater threats to sustainability and have had an insufficient number of assessments

Beyond the North-East Atlantic, the picture is far less positive, with a low likelihood that the 2020 policy objective of attaining good environmental status will be met in the Mediterranean and Black Seas ([23]). On average, fishing pressure in the Mediterranean is two and a half times greater than F/F_{MSY} in the North-East Atlantic ([24]). The mean values of F/F_{MSY} assessments remained at very high levels during the whole period from 2003 to 2015, with no decreasing trend. The assessments vary around 2.3, indicating that stocks are being exploited on average at rates well above the CFP objective of F_{MSY}. As this objective was to be reached for all stocks by 2015 where possible and at the latest by 2020, efforts need to be increased substantially if the EU is to meet its own targets for sustainable fisheries.

Out of the 47 stocks assessed up to 2016, the majority are overfished; only six stocks (around 13 %) are not overfished ([25]). With regards to reproductive capacity, spawning stock biomass (SSB) in the Mediterranean and Black Sea also continues to be chronic, with stocks showing an average biomass decline of 25 % between 2003 and 2015 ([26]).

However, any apparent trends relating to SSB in the Mediterranean and Black Sea should be viewed with caution. There have been strong variations in the number of stocks for which information is available, which makes it difficult to allow for a robust indication of the true extent of overfishing ([27]).

Ocean health

Healthy and productive oceans are crucial for achieving SDG 14. For this to be accomplished, ocean acidification will need to be further restrained and marine pollution prevented. Within this context, two different topics are monitored: bathing water quality and ocean acidification.

Bathing water quality is affected by sewage discharge which creates unpleasant and unsafe conditions for bathing. Organic pollutants and excess nutrients from fertilisers on farmland as well as litter, while not directly harmful to humans, also lead to significant pressures on aquatic ecosystems and underwater life.

Ocean acidification occurs where increased levels of CO_2 are absorbed by the ocean and reduce sea water pH levels. This problem is a growing threat to ocean health and productivity. Lower pH levels affect the growth of corals and species such as mussels and other shellfishes and can impact processes such as photosynthesis, with knock-on effects for entire ecosystems ([28]).

The EU is committed to improving water quality in its regional seas and coastal areas through a range of policies. Some positive results are emerging in terms of bathing water quality and reduction of point source pollution through improved wastewater treatment. This chapter analyses the quality of coastal and transitional waters only. See the chapter on SDG 6 'Clean water and sanitation' on page 118 for a more detailed analysis of the quality of inland waters.

Excellent bathing water quality is increasingly being achieved in European coastal waters

Under the EU Bathing Water Directive ([29]), bathing water quality has improved steadily since 2012. Bathing water quality takes into account microbiological and physicochemical parameters to monitor, for example, faecal and chemical contamination. Water quality is analysed during the bathing season and classified as being poor, sufficient, good or excellent based on the previous four years of data. As the classification always takes into account preceding years, bathing water quality does not tend to fluctuate greatly from year to year. Only a small number (1.4 %) of sites failed to meet minimum quality standards in 2017, and the general trend has been towards very high water quality, with the number of European bathing sites with an 'excellent' rating growing almost steadily between 2012 and 2017 ([30]). In 2017, 86.3 % of marine bathing sites and 82.1 % of inland bathing sites were classified as having 'excellent' water quality. It should be noted though that the bathing water indicator provides only a limited representation of the state of European seas because it is limited to bathing sites located on inland, transitional or coastal waters and excludes marine waters beyond one nautical mile of the baseline ([31]).

86.3 %
of EU seawater bathing sites had excellent water quality in 2017

The EU Bathing Water Directive ([32]) is one of the success stories in EU water policy and has played an important role in protecting human health and the environment. Bathing water quality is also dependent on the successful implementation of the Marine Strategy Framework Directive ([33]) and the Water Framework Directive ([34]).

In 2017, the five Member States with the highest proportion of 'excellent' marine bathing water quality sites were all in the eastern Mediterranean. This may be due to limited rainfall and river flow during summer, greater sunlight and ultraviolet radiation in this region which all contribute to a higher quality of coastal bathing waters. In contrast, in the Baltic Sea and Greater North Sea, a higher proportion of both coastal and transitional water bodies is affected by pollution pressures.

Pollution continues to threaten the marine environment

Despite improvements in bathing water quality, organic and chemical pollutants from human activities as well as marine litter continue to pose a serious threat to Europe's marine ecosystems. In early 2018, only 58 % of coastal water bodies were reported to have a good chemical status according to the Water Framework Directive ([35]).

Excessive loads of nutrients from agriculture and municipal wastewater (nitrogen and phosphorus) create eutrophication, a process characterised by increased plant growth, problematic algal blooms, depletion of oxygen, loss of life in bottom water, and an undesirable disturbance to the marine trophic webs ([36]). The EEA monitors the levels and trends in winter means of dissolved inorganic nitrogen (nitrate + nitrite + ammonium), oxidised nitrogen (nitrate + nitrite) and phosphate concentrations (micromol/l) in Europe's regional seas ([37]). A lack of data for the Black and Mediterranean Seas makes it difficult to assess trends, although the measurements that exist for the Mediterranean generally show low levels of eutrophication. The lack of data for the Black Sea is of greater concern, as this area, like the Baltic Sea, is particularly prone to eutrophication due to low levels of water exchange with connecting seas ([38]).

In the Baltic Sea, nitrogen concentrations are decreasing but phosphate concentrations show an increase at some stations. In the Atlantic region, a lack of data makes it impossible to analyse overall trends in dissolved nitrogen concentrations, and no significant changes in phosphorus concentrations were observed. For the Greater North Sea, however, long-term (greater than

To support the reduction of nutrient loads to European waters, the Nitrates Directive ([39]) and the Urban Waste Water Treatment Directive ([40]) aim to reduce pollution caused by nitrates from agricultural and industrial sources respectively. To tackle marine pollution, the EU uses a wide set of instruments, including regulation on waste management and prevention ([41]), port reception facilities ([42]) for ship-generated waste and cargo residues. REACH ([43]), the EU framework to improve the protection of human health and the environment from the risks that can be posed by chemicals, includes contaminants in seafood and marine litter.

10 years) time series data show some positive developments in nutrient reductions. In the case of phosphorus, this can be attributed to improved wastewater treatment, which led to a significant reduction of phosphorus loading in most North Sea countries between 1985 and 2005 ([44]). However, due to time lags in the marine system, reductions in nutrient loads have not yet resulted in an improvement of the overall eutrophication status in this area ([45]).

Next to organic pollution, chemical pollution with hazardous substances and marine litter are important threats to the marine environment. Chemical pollution can originate from a number of land-based and marine sources, including agriculture (through the application of pesticides and veterinary medicines), industry, households and the transport sector. The EEA monitors eight hazardous substances in marine organisms, including cadmium, mercury, lead, HCB, lindane, DDT, PCB and BAP. Levels of most of these substances were low or moderate in 2012, apart from PCB, which was found in moderate or high concentrations in marine organisms between 2003 and 2012. A downward trend was observed in the North-East Atlantic for all of the substances except for mercury and HCB. In the Baltic Sea, reductions in lindane and PCB were observed, indicating that the abatement measures for these substances were successful ([46]). For the other regional seas, no such trend could be observed. Apart from these eight chemicals, many other substances are released into Europe's seas on a daily basis for which no common monitoring is yet in place. Of particular concern are the persistent organic pollutants (POPs), which degrade slowly and can bio-accumulate in the food chain.

With regards to marine litter, estimations of plastic entering oceans in Europe are highly tentative, due to a lack of data and a strong variability of spatial distribution of litter within the oceans. However, based on scientific studies, the European Commission estimates that 150 000 to 500 000 tonnes of plastic enter the oceans in the EU every

In January 2018, the EU published the European Strategy for Plastics in a Circular Economy ([47]), which outlines several elements: the obligation of Member states to monitor and reduce marine litter in scope of the MSFD, the obligation to adopt measures for the reduction of the consumption of single use items, such as plastic bags ([48]), a 55 % target for the recycling of plastic packaging waste by 2030 and a promotion of research and innovation on product design and biodegradable plastics.

Recognising the limitations of tackling ocean problems at a Member State or European level, the EU and its Member States are working on strengthening the ocean governance framework worldwide to achieve the conservation and sustainable use of international waters. The EU has expressed its commitment in a joint communication on international ocean governance ([49]). Furthermore, the EU and its Member States actively participate in the regional seas conventions (OSPAR, HELCOM, Barcelona Convention and Bucharest Convention).

year ([50]). Marine plastic can come from both land-based sources (for example, rivers or surface water runoff combined with improper disposal) and sea-based sources (ship waste and lost or disposed fishing gear). Single-use plastics pose a particular problem because they account for about 50 % of all marine litter ([51]). Research regarding the environmental impact of plastic in the marine environment is still ongoing. Among other impacts, plastic items are known to strangulate and trap marine species. Furthermore, scientific evidence suggests that microplastic can further exacerbate chemical pollution — its absorbent characteristics can attract other contaminants, which may result in further accumulation of these contaminants in the food chain, once microplastic particles are ingested ([52]). Furthermore, plastic additives, such as softeners (phtalates) or structural constituents (bisphenol), can leach into the seawater and once ingested can harm species, including through sexual disruption, inhibited locomotion or genotoxic damage ([53]).

The minimisation of human-induced eutrophication, contaminant concentrations and marine litter each constitute one of the 11 descriptors of good environmental status — the goal that is to be achieved under the Marine Strategy Framework Directive (MSFD). However, targets and thresholds have to be set at the national level; a process which is still ongoing.

Ocean acidification poses a risk to the marine environment and global climate regulation

Globally, surface ocean pH has reached an unprecedented low and is declining at a steady rate. Increased acidity affects the ocean's capacity to act as a carbon sink and to regulate global CO_2 emissions and is expected to have severe knock-on effects for marine species and ecosystems. Before industrialisation, pH levels varied between 8.3 and 8.2. These levels are now decreasing at an alarming rate, with surface ocean pH reaching 8.04 by September 2014. Reductions in pH levels are projected as far as 7.75 by the end of the 21st century, depending on future CO_2 emission levels ([54]). EU leadership to mitigate climate change is of vital importance not only to achieving SDG 13 (climate action) but also for reaching the targets of SDG 14.

In September 2014, the mean pH level of ocean water reached a new low of

8.04

The EU has a range of strategies which aim to mitigate climate change and greenhouse gas (GHG) emissions, including CO_2. These include for example, the Europe 2020 Energy Strategy ([55]) to cut GHG emissions by 20 % compared to 1990, to ensure 20 % energy from renewables and a 20 % increase in energy efficiency. The Circular Economy Package ([56]) also contributes to mitigation through greater resource and energy efficiency (also see the chapter on SDG 13 'Climate action' on page 239).

Presentation of the main indicators

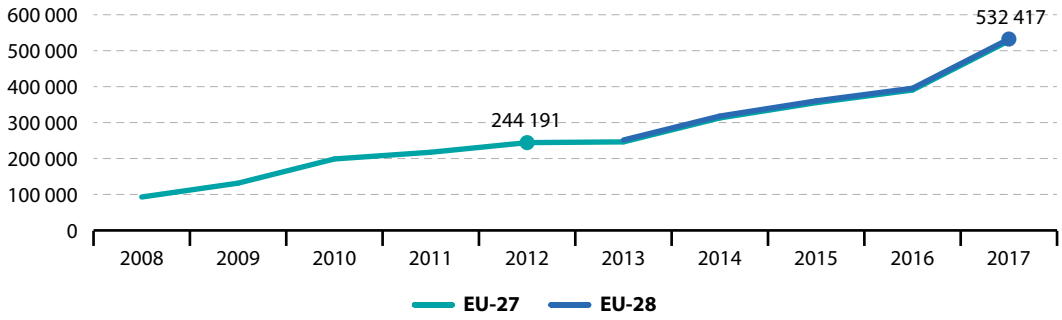
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2012–2017

Surface of marine sites designated under Natura 2000

The EU Birds and Habitats Directives require Member States to designate and manage Sites of Community Importance (SCIs) where habitats and species of EU interest should be maintained in or restored to favourable conservation status. Together, the SCIs constitute the Natura 2000 network. This indicator measures the surface area covered by marine SCIs (km²). A thorough typology has been developed to support precise reporting. Data provided by the Member States to the Commission are consolidated at least yearly by the European Environment Agency and the European Topic Centre on Biological Diversity (EEA ETC/BD) and collected by European Commission Directorate-General for the Environment.

Figure 14.1: Surface of marine sites designated under Natura 2000, EU-27 and EU-28, 2008–2017 (km²)



Source: European Commission services, European Environment Agency (online data code: sdg_14_10)

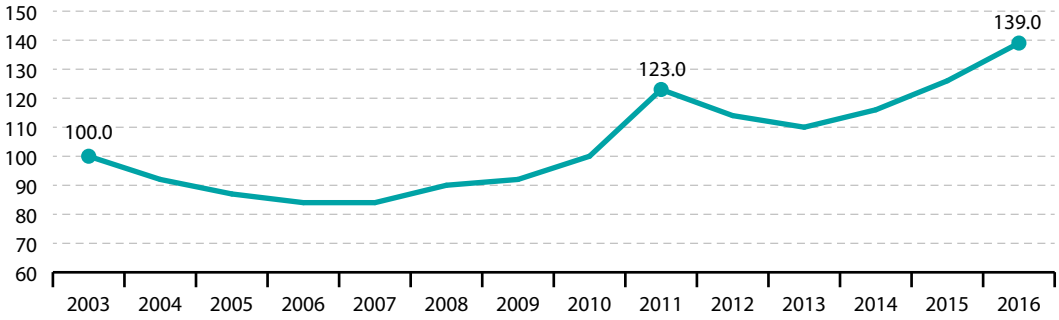
The area of protected marine sites designated under Natura 2000 increased from 92 894 km² in 2008 to 532 417 km² in 2017, which represents a more than five-fold increase. While the time series is too short to express a long-term trend, the short-term period from 2012 to 2017 has seen an average annual increase in the extent of protected areas of 16.9 %.

Estimated trends in fish stock biomass

X Indication of progress not possible

Fish stock biomass is a function of biological characteristics such as abundance and weight and can indicate the status of a fish stock when measured against reference values. This is a model-based indicator that is computed using results from single-species quantitative stock assessments. It shows the median value of fish stock biomass relative to 2003 for the North-East Atlantic and adjacent seas (FAO area 27) ([57]). Time series for estimates of stock biomass are provided by the International Council for the Exploration of the Sea (ICES), the General Fisheries Commission for the Mediterranean (GFCM) and the EU Joint Research Centre's Scientific, Technical and Economic Committee for Fisheries (STECF). The model-based indicator for stock biomass for the Mediterranean and Black Sea is currently excluded because it is associated with high uncertainties due to the fact that biomass estimates for this area are quite variable from one year to the next ([58]).

Figure 14.2: Estimated trends in fish stock biomass, North-East Atlantic and adjacent seas, 2003–2016
(Index 2003 = 100)



Source: Joint Research Centre (JRC) — Scientific, Technical and Economic Committee for Fisheries (STECF) 2018 (online data code: sdg_14_21)

The model-based indicator depicted in Figure 14.2 shows a long-term improvement in the trend for biomass in the North-East Atlantic and adjacent seas. In this fishing area, biomass has generally been expanding since 2007, and in 2016 was assessed as 39 % higher than in 2003, with an average annual growth of 2.6 % between 2003 and 2016. The short-term trend is also positive, with an average increase of 2.5 % between 2011 and 2016.

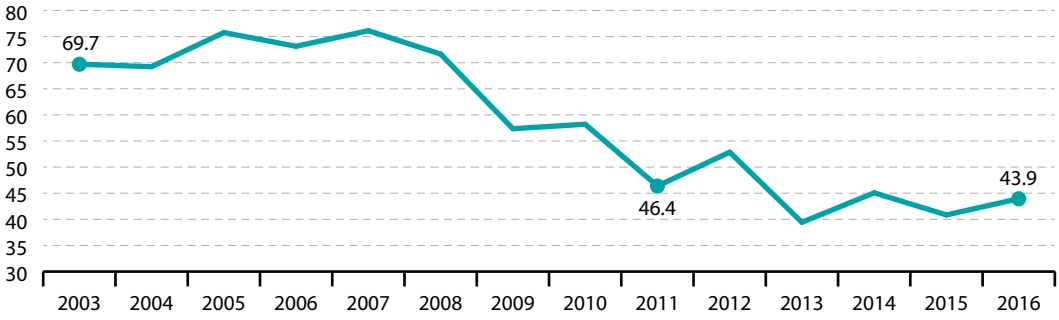
X Indication of progress not possible

Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (F_{MSY})

To ensure fish stocks are exploited sustainably, the CFP aims to rebuild stocks above levels at which they can produce the maximum sustainable yield (MSY). MSY is determined by the long-term average stock size that allows fishing at this level. The indicator measures the proportion of assessed fish stocks where current fishing mortality (F) exceeds the estimated maximum sustainable yield (F_{MSY}), expressed with the term $F > F_{MSY}$. Data are provided by the Joint Research Centre (JRC). The model-based indicator for F/F_{MSY} for the Mediterranean and Black Sea is currently excluded because it is not very robust due to the large changes in the number of stocks available to fit the model ([59]).

Figure 14.3: Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (F_{MSY}) in the North-East Atlantic, 2003–2016

(% of stocks exceeding fishing mortality at maximum sustainable yield ($F>F_{MSY}$))



Source: Joint Research Centre (JRC) (online data code: sdg_14_30)

Figure 14.3 shows that in the North-East Atlantic ([60]), from where most of the EU catch originates, levels of overexploitation have generally fallen over the past decade. This positive development is visible in both the long-term period from 2003 to 2016, during which the share of overexploited stocks fell by 3.5 % per year on average, and the short-term period 2011 to 2016, when it fell by 1.1 % annually.

Bathing sites with excellent water quality

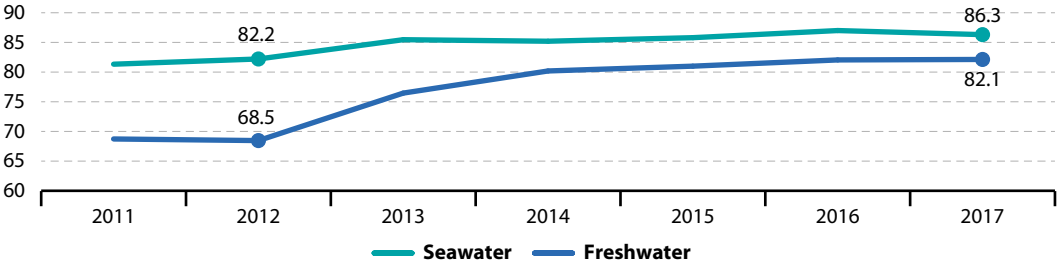
LONG TERM
Insufficient data to caculate trend

SHORT TERM
2012–2017
* **

* Seawater bathing sites
** Freshwater bathing sites

The new Bathing Water Directive (BWD) requires Member States to identify and assess the quality of all inland and marine bathing waters and to classify these waters as 'poor', 'sufficient', 'good' or 'excellent'. Bathing water quality is assessed according to standards for microbiological parameters (intestinal enterococci and *Escherichia coli*). The data presented in this section stem from the European Environment Agency (EEA) and are based on MS reporting under the BWD and described in the annual Bathing Water report.

Figure 14.4: Bathing sites with excellent water quality by locality, Europe, 2012–2017
(% of bathing sites with excellent water quality)

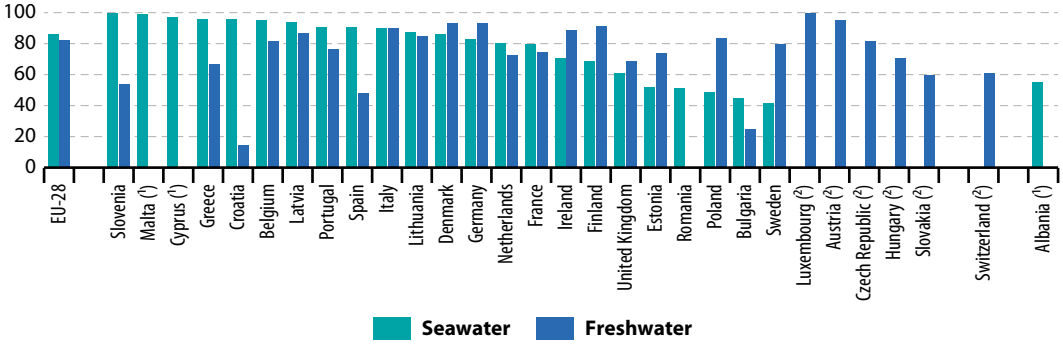


Note: 'Europe' refers to the member countries of the European Environment Agency, including the 28 EU Member States plus the EFTA countries (Iceland, Liechtenstein, Norway and Switzerland) and Albania, Bosnia and Herzegovina, Serbia and the former Yugoslav Republic of Macedonia. 'Seawater' refers to surface waters up to one nautical mile from the baseline and transitional waters (partly saline surface waters that are substantially influenced by freshwater flows); data include all EU Member States except for landlocked countries. 'Freshwater' refers to inland surface waters such as rivers and lakes; data include all EU Member States except for Cyprus and Malta.

Source: European Environment Agency (online data code: sdg_14_40)

Although a long-term evaluation reaching back before 2011 is not possible, a small but steady increase in the number of seawater bathing sites classified as 'excellent' was visible between 2012 and 2017 with an average annual increase of 1.0 %. For freshwater bathing sites, the increase in the number of sites classified as excellent was more pronounced, with 3.7 % per year on average over the same time period.

Figure 14.5: Bathing sites with excellent water quality by locality, by country, 2017
(% of bathing sites with excellent water quality)



(1) No measurements of freshwater bathing sites. (2) No seawater bathing sites (landlocked country).

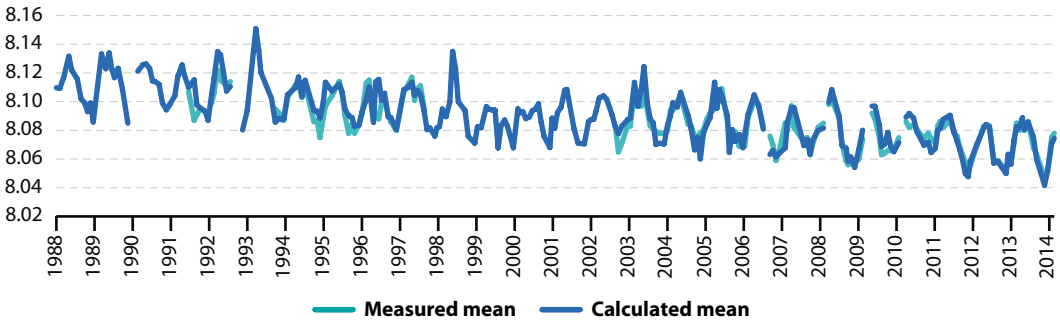
Source: European Environment Agency (online data code: sdg_14_40)

X Indication of progress not possible

Mean ocean acidity

This indicator shows the mean pH level of ocean water. The decline in pH corresponds to an increase in the acidity of ocean water and vice versa. From the end of 2018, the European Earth Observation Programme, Copernicus, will monitor pH both at global scales and for European seas and will provide the basis for the Eurostat ocean acidification indicator. In the meantime, proxy data are used from the ALOHA monitoring station in Hawaii, which monitors a suite of physical and biogeochemical properties (including salinity, DIC, TA, phosphate, silicate and dissolved oxygen) ([61]).

Figure 14.6: Mean ocean acidity, 1988–2014
(pH value)



Source: Indicator provider: European Environment Agency (online data code: sdg_14_50), Data provider: Laboratory for Microbial Oceanography (Hawaii) (online data; Station Aloha Surface Ocean Carbon Dioxide)

Despite the visible intra-annual variation, this indicator provides clear evidence of a consistent and alarming decline in ocean pH with calculated annual surface ocean pH reaching a new low of 8.04 in September 2014.

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15

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 15 seeks to protect, restore and promote the conservation and sustainable use of terrestrial, inland-water and mountain ecosystems. This includes efforts to sustainably manage forests and halt deforestation, combat desertification, restore degraded land and soil, halt biodiversity loss and protect threatened species.

eurostat supports the SDGs

Along with SDG 14, SDG 15 is the key goal at international level that incorporates environmental considerations for UN member countries. In the EU, this goal ensures that ecosystem health and functioning, with the delivery of ecosystem services, remain a priority, especially in the face of global trends such as population growth, accelerating urbanisation and the increasing need for natural resources. Ecosystem services provided by terrestrial ecosystems offer many benefits to society, including recreation, natural resources, clean air and water, as well as protection from natural disasters and mitigation of climate change. However, human activities that damage ecosystems and increase land degradation threaten the provision of these services and diminish biodiversity. Thus, the EU endeavours to ensure healthy and sustainably used and managed ecosystems.

Table 15.1: Indicators measuring progress towards SDG 15, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Ecosystems status			
Share of forest area	:	↑ (1)	page 286
Biochemical oxygen demand in rivers (*)	↑ (2)	↑	SDG 6, page 124
Nitrate in groundwater (*)	↗ (3)	↑	SDG 6, page 125
Phosphate in rivers (*)	↑ (2)	↘	SDG 6, page 126
Land degradation			
Artificial land cover per capita	:	↘ (1)(4)	page 287
Estimated soil erosion by water	↑ (3)	:	page 289
Biodiversity			
Surface of terrestrial sites designated under Natura 2000	:	↗ (5)	page 290
Common bird index	↘	↗	page 291
Grassland butterfly index	↓ (6)	↓ (6)	page 292

(*) Multi-purpose indicator.
(1) Past 6-year period.
(2) Past 14-year period.
(3) Past 12-year period.
(4) Data refer to EU-23 (EU-28 excluding Bulgaria, Cyprus, Croatia, Malta and Romania).
(5) Data refer to EU-27.
(6) Data refer to 15 Member States.

Table 15.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
🎯	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Life on land in the EU: overview and key trends

Monitoring SDG 15 in an EU context focuses on ecosystem status, land degradation, and biodiversity. According to the selected indicators (see Table 15.1), the EU has made progress on improving the ecosystem status over the past few years. However, progress in slowing land degradation and increasing biodiversity has been mixed and most indicators of biodiversity, including those beyond those featured in the report, show continued and strong declines in biodiversity and species abundance ([1]).

Ecosystem status

Humans greatly benefit from many ecosystem services, such as clean air, purified water and food. In addition, terrestrial ecosystems offer natural resources used in industrial processes, as well as cultural services such as outdoor recreation. Other services provided by ecosystems include protection from natural disasters and the mitigation of the negative effects of climate change. Human activities that degrade ecosystems, including pollution and overuse of resources, threaten the provisioning of ecosystem services and their benefits. Hence, EU legislation such as the Birds and Habitats Directives and the EU Biodiversity Strategy to 2020 help to ensure a healthy ecosystem status and that terrestrial ecosystems and the services they provide are sustainably used and managed. 'Ecosystem status' can be assessed by comparing the state of an ecosystem against the goals and objectives set within these Directives, as well as the EU Biodiversity Strategy and other policy targets. This can include legal parameters allowing certain levels of pollutants or chemicals in an ecosystem, with the main aim of averting unwanted consequences resulting from human activities. Conservation and monitoring efforts are essential in ensuring that Europe's ecosystems remain or are restored to a healthy state.

The indicators selected for monitoring ecosystem status assess mainly abiotic parameters indicating ecosystem health, including pollutants in rivers and in groundwater as well as the share of forests in total land area. The living parts of ecosystems and their state are assessed in the section on 'biodiversity', see page 284). Overall, the indicators on ecosystem status provide an indication of Europe's ecosystem health for only a small portion of its land and freshwater areas. It is important to recognise the limitations of these indicators in presenting a full and complete picture of Europe's terrestrial ecosystems, the status of which cannot be fully addressed with the available long-term datasets. Hence, though the indicators chosen show positive trends for Europe's terrestrial ecosystems, this does not truly reflect all ecosystems (for example, wetlands, plains, mountain regions, floodplains and marshes) nor all pressures and stresses (such as other nitrate and phosphorous pollution, habitat fragmentation, noise and light pollution, water stress and availability and invasive species). However, despite these limitations, the selected indicators and the available data do provide relevant information on key aspects of SDG 15 and their implementation in the EU.

Nitrate and phosphate pollution in European rivers has decreased since 2000

The ecological status of European water bodies is an important indication of how Europe's natural environment is faring in the face of pressures from human use. Three indicators monitor progress: biochemical oxygen demand in rivers, nitrate in groundwater and phosphate in rivers. Combined, these indicators paint a rather favourable picture of the EU's progress over the past 14 years, with decreasing levels of pollution in both rivers and groundwater bodies. In rivers, both concentrations of phosphate (PO_4) and biochemical oxygen demand (BOD) have fallen since 2000, reaching levels of 0.068 milligrams (mg) of PO_4 per litre and BOD of 1.94 mg of O_2 per litre in 2014. However, while the decline has been more or less continuous for biochemical oxygen demand over the whole time series, phosphate concentrations have shown a recent turnaround, with increasing

levels of pollution since 2011. Nitrate (NO_3) levels in groundwater have developed differently as well, increasing from 2000 to 2006, and decreasing back to the levels of 2000 by 2012, at 19.1 mg of NO_3 per litre.

In 2014, the biochemical oxygen demand in European rivers amounted to

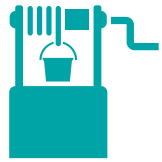
1.9 mg/L

Biochemical oxygen demand in rivers is an indicator of organic water pollution in rivers and the effectiveness of water treatment ([2]). Measuring the amount of oxygen required for microbiological decomposition of organic compounds in water indicates the state of health of river systems. Fortunately, the EU has shown a positive trend in river water quality since 2000, which is helping to improve the state of aquatic ecosystems and their biodiversity. In 2014, EU levels of biochemical oxygen demand fell to 1.94 mg of O_2 per litre. This represents a 31 % reduction from 2000 levels of 2.81 mg of O_2 per litre. Between 2009 and 2014, the majority of EU countries saw reductions in biochemical oxygen demand in their rivers, with the exception of Austria, Croatia, Denmark, Ireland, Italy, Slovakia and Romania.

Pollutants in the EU's groundwater and rivers have generally reduced over time, though individual levels vary by Member State as well as between regions within Member States. For example, Member States' levels of nitrate in groundwater varied widely between 2000 and 2012. Groundwater flows directly interact with rivers, lakes and wetlands, and are often used for drinking water and for agricultural irrigation. As such, groundwater has a high economic, social and environmental value ([3]). Pollution of groundwater with high levels of nitrates can pose risks to public health and contribute to environmental degradation. Nitrate pollution of this kind is generally caused by the high use of mineral fertilisers and intensive agricultural practices, such as the application of slurry and manure ([4]). In 2012, average EU nitrate levels were at 19.1 mg per litre (mg/l) and thus at the same level as in 2000, with the majority of Member States complying with the levels defined for safe use (below 50 mg/l). Large variations of nitrate levels in groundwater exist in different regions in the EU, spanning from less than 10 mg/l to more than 50 mg/l ([5]). In some cases, similar variations can be found in Member States within their territories, regularly leading to interventions by the European Court of Justice for the failure to meet nitrate standards for groundwater. This was for example the case for France in 2014 ([6]) and Germany in 2016 ([7]). Overall, between 2012 and 2015, 13.2 % of groundwater stations were considered polluted under the Nitrates Directive (exceeding 50 mg nitrates per litre) and regional pressures and pollution hotspots remain ([8]).

0.068

mg/L of phosphates were present in European rivers in 2014



In 2012, the concentration of nitrates in groundwater in Europe reached

19.1 mg/L

Phosphate in rivers can originate from agricultural production, urban wastewater and industrial discharges ([9]). Negative environmental consequences of phosphate in rivers can manifest as biodiversity loss and eutrophication in rivers.

EU legislation on freshwater water quality is mainly embodied within the Water Framework Directive ([10]). This directive imposes restrictions on activities that could pollute and damage Europe's freshwater resources. As such, the Directive aims for all surface water and groundwater sources to reach 'good ecological status' and 'good chemical status'. This legislation is complemented by the EU Drinking Water Directive ([11]) and Nitrates Directive ([12]), which also impose restrictions on levels of chemicals and minerals in Europe's freshwater resources.

On average European phosphate concentrations have fallen by 22 % since 2000, reaching levels of 0.068 mg/l in 2014. Nevertheless, the short-term trend over the past five years has been slightly unfavourable, as phosphate concentrations have been increasing since 2011. Overall, reductions in phosphate concentrations can be linked to the introduction of measures by national and European legislation (such as the Urban Waste Water Treatment Directive ([13])) and the switch to phosphate-free detergents ([14]). Some countries, especially in eastern Europe, have higher phosphate levels in their rivers due to higher agricultural pressure as well as underequipped treatment plants for tertiary treatment.

Europe's share of forest area has continued to improve gradually

Europe's forests provide multiple benefits, such as enhancing soil fertility and conserving soil moisture, storing carbon and providing habitats for animals and plants. They also help mitigate climate change and regulate the microclimate ([15]). Currently, forest ecosystems are under pressure from habitat change and degradation from over-exploitation ([16]), making EU efforts to retain and sustainably manage its forested areas increasingly important.

In 2015, forests and other wooded land covered 41.9 % of the EU's total land area. The EU share of forests in proportion to total land area increased slightly by 2.6 percentage points between 2009 and 2015 ([21]). This increase can be attributed to the increase in the Food and Agriculture Organization (FAO) category 'forests' ([22]), which is defined as land spanning more than 0.5 hectares with trees larger than 5 metres high with a canopy cover of more than 10 % ([23]). The share of this area increased by 1.6 percentage points between 2009 and 2015.

In 2015, the share of forests in total EU land area reached

41.9 %

Though the above indicator provides an indication of the share of land dedicated to forests, it does not provide any information on the condition or growing stock of forests in the EU. Growing stock, increment and fellings of forests ([24]) can be used as an indicator of the economic sustainability of timber-producing operations in forests. Furthermore, data on growing stock, increment and fellings are important for calculating carbon budgets in the forest sector. For long-term economic sustainability, annual fellings should not exceed the net annual increment and according to the European Environment Agency (EEA) the ratio of fellings to increment should be less than 70 % over the long term ([25]). Increases in growing stock relative to forest area indicate a maturing forest.

In general, most Member States maintained their ratio of forest fellings to increment at below 80 % in 2010, with the exception of countries such as Austria, Belgium, the Czech Republic, Germany and Sweden which have ratios higher than 80 %. Though these high rates of forest fellings allow the EU's forest stock to be thinned, thus helping them to rejuvenate by leaving more open space and light for natural forest habitats to develop, they exceed the recommended average of 70 % for sustainable forest production. There is also high pressure on the EU's forests to produce more fuel wood, as the production of energy from renewable sources still depends mainly on this resource (for example, for wood chips and wood pellets). Further continued expansion of forest fellings may result in unsustainable forest management and a reduction in ecosystem services ([26]).

The new EU Forest Strategy ([17]) from 2013 builds on the objectives stated under the EU Biodiversity Strategy to 2020 ([18]) and its target on forest preservation and management. The Forest Strategy stresses the importance and multiple socio-economic and environmental benefits of sustainable forest management. Forests are also covered in the Habitats Directive ([19]) as habitats of EU interest and under the Europe 2020 strategy ([20]) for their relevance for reducing CO_2 emissions and combating climate change.

Land degradation

Land degradation is a complex phenomenon that is linked to the long-term biological productivity of land. It brings together several elements, including soil degradation and the capacity of land areas to support water resources, biodiversity and primary productivity ([27]). Soil degradation by itself covers many aspects such as soil sealing and contamination, erosion by wind and water, loss of soil biodiversity, decline in organic matter, desertification, acidification and salination ([28]). Not all of these can be covered in this indicator set, limiting the analysis to artificial land cover and soil erosion by water.

Artificial land cover increased in the EU despite efforts to limit soil sealing and land degradation

Land degradation through land take — meaning the conversion of natural or semi-natural land to artificial surfaces — is not only increasing across the EU, its rate is also accelerating. While artificial areas grew by 3.7 % between 2009 and 2012, this rate increased to 4.0 % between 2012 and 2015, indicating an acceleration of land use change towards artificial and urban land use ([29]). Between 2006 and 2012, mainly agricultural areas were converted to artificial surfaces in the EU (51.9 % of the converted area were arable land and permanent crops, and 25.9 % were pastures and mixed agricultural areas), with lesser conversion of forests and semi-natural and natural areas (around 22 %) ([30]). The conversion of these areas was mainly towards construction sites, representing transitional sites that become urbanised land in the future. Industrial and commercial sites accounted for the second largest area, followed by mines, quarries and waste sites. Residential housing and recreation were responsible for the fourth largest area ([31]). Land use and land cover change on this scale, as well as the loss and fragmentation of natural ecosystems, negatively affects biodiversity and does not place the EU on track to meet its targets to limit land take to less than 800 km^2 per year by 2020.

Between 2012 and 2015, artificial areas in the EU grew by

4.0 %

Artificial land cover per person has increased since 2009, spurred by the exploitation of natural areas for more housing and recreational sites

Artificial land cover per capita has increased since 2009, despite EU efforts to limit land take and soil sealing and to increase land-use efficiency. The EU's artificial land cover per capita spread from 347.3 m^2 in 2009 to 367.2 m^2 in 2015. Reasons for this trend can be linked to the growing demand for increased living space per person, including secondary homes ([32]), and to ever-expanding levels of economic activity and increased mobility ([33]). Land as a natural and economic resource is

367.2

square metres of land were covered by artificial surfaces per capita in the EU in 2015

The EU has released guidelines with best practices to limit, mitigate or compensate soil sealing. These guidelines aim to support the EU's Soil Thematic Strategy ([34]) and the goal of limiting annual land take (the increase of artificial land) to less than 800 km2 per year by 2020 and no net land take by 2050 set in the Roadmap to a Resource-Efficient Europe ([35]). The EU has funded research and improved soil monitoring through projects such as LUCAS, a survey on land cover, land use and agro-environmental indicators run by Eurostat, and Copernicus, the European Union's Earth Observation and Monitoring Programme, which provides Corine Land Cover and High Resolution Layers on imperviousness, grasslands, forests, water and wetness on a full, free and open basis.

used for a variety of purposes: agriculture and forestry; mining, manufacturing and construction; distributive trades, transport and other services, as well as for residential housing and recreation largely at the expense of natural areas ([36]). The negative social and environmental consequences caused by the spread of artificial surfaces can include the escalation of flood risk, damage to biodiversity and natural habitats, the contribution to global warming and the reduction of the amount of land available for food production ([37]).

Estimates for soil erosion by water indicate a potential decline in soil erosion in the EU

Soil is a resource that provides multiple benefits to society, including the provision of raw materials, food production, and the storage, filtration and transformation of many substances including water, carbon and nitrogen ([38]). Retaining soil health and natural landscapes ensures the continued provision of such benefits. Soil erosion by water is one of the major threats to soils in the EU and contributes to land degradation by removing fertile topsoil. Soil erosion by water has substantial on-site as well as off-site effects. Removing fertile topsoil reduces soil productivity and threatens crop production, quality of drinking water, habitats and biodiversity, and carbon stocks ([39]). Efforts to address and mitigate soil erosion by water have generated positive results that have reduced the estimated risk of severe soil erosion by water by 14 % in the EU between 2000 and 2012. One study stated that in agricultural lands, for example, improvements due to the implementation of agro-environmental standards required under the Common Agricultural Policy (CAP) saw reductions in the mean rate of soil loss by water erosion up to 30 % in some Member States between 2003 and 2010 ([40]). Improvements include reduced tillage, minimum soil cover, reduction in the area of bare soils, contour farming along slopes, maintenance of terraces and stone walls, and extended use of grass margins ([41]). However, over half of the agricultural area in the EU remains at risk of being eroded at a rate that is faster than soils can be replaced naturally (over 1 tonne per hectare per year (t/ha/yr)). Moderate to severe erosion (higher than 5 t/ha/yr) is estimated to affect nearly 13 % of EU arable soils and about 10 % of permanent pastureland, and 0.4 % of EU soils are estimated to suffer from extreme erosion (over 50 t/ha/yr) ([42]).

Between 2000 and 2012, the estimated risk of severe soil erosion by water in the EU fell by

14.0 %

Organic carbon content of topsoil has been declining in croplands in most EU Member States, but the picture is rather mixed for grassland

The Joint Research Centre (JRC) of the European Commission is currently developing an indicator measuring the organic content of topsoil in cropland and grassland soils based on the Land Use and Land Cover survey (LUCAS) for 2009, 2012 and 2015. Carbon is one of the main components of soil organic matter that constitutes fertile topsoil. Early results show that between 2009 and 2015 the topsoil organic carbon content in croplands has slightly decreased in most EU Member States. In grasslands, however, the results give a more mixed picture, with many countries showing an increase in topsoil organic carbon content and only a few showing a decline. Changes in soil organic carbon content are driven by human-induced factors, such as land

Erosion is a recognised threat to soil in the EU's Soil Thematic Strategy ([43]). The Roadmap to a Resource-Efficient Europe ([44]) sets out a milestone to reduce soil erosion and requires Member States to implement the actions needed to reduce erosion. Europe's Common Agricultural Policy sets requirements to protect utilised agricultural areas against erosion and establishes a framework of standards that aim, among others, to contribute to preventing soil erosion.

management practices and land-use change, and by natural factors, such as climate, topography, vegetation and soil parental material ([45]).

Biodiversity

Terrestrial ecosystems have been protected under the Birds Directive since 1979 and the EU Habitats Directive since 1992. Both Directives form the main pillar for the protection of Europe's biodiversity and ecosystems. Under these Nature Directives, Member States are required to designate and manage Special Protection Areas (SPAs; Birds Directive) and Sites of Community Importance (SCIs; Habitats Directive) and if necessary restore them to favourable conservation status. These sites determine a Member State's protected areas under the EU Nature Directives and, when combined, constitute the Natura 2000 network. In 2017, the EU had protected more than 790 000 km^2 of terrestrial habitats through Member State's designated Natura 2000 sites, covering 18.2 % of EU's terrestrial land area. Member States with the highest percentage of protected areas in 2017 include Slovenia (37.9 %), Croatia (36.6 %) and Bulgaria (34.5 %), with the lowest percentages attributed to the UK (8.6 %) and Denmark (8.3 %) ([46]). The designation of additional terrestrial protected areas grew strongly until 2011, and has since then stayed more or less at the same level.

790 213

square kilometres of EU terrestrial sites were protected in 2017 under the Natura 2000 network

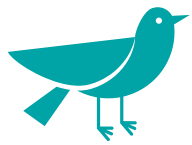
Though protected, many terrestrial habitats and species have not reached 'favourable conservation status' under the Habitats Directive

Assessments of the conservation status of species of European interest ([47]) and habitats of European interest ([48]) revealed that many species and habitats did not meet favourable condition standards as set out within the Directive. Across the EU (not including Greece), only 23 % of species assessments and 16 % of habitats assessments were considered 'favourable' in 2012, with the majority of them assessed as unfavourable (60 % for species and 47 % for habitats), unfavourable to bad, or declining (18 % for species and 30 % for habitats). Taxonomic groups with a particularly high proportion of species with a deteriorating trend in conservation status were mainly fish, molluscs and amphibians. Habitats showing a declining trend tended to be bogs, mires and fens, followed by grasslands. The majority of forests and freshwater habitat assessments were unfavourable, but with a stable trend.

The EU Biodiversity Strategy to 2020 ([49]) sets out 6 targets and 20 actions to halt the loss of biodiversity and ecosystem services in the EU by 2020. The Habitats Directive ([50]) and the Birds Directive ([51]) play a central role in achieving these targets. In 2015, the European Commission published the mid-term review of the EU Biodiversity Strategy to 2020, reporting on the progress towards the EU biodiversity targets ([52]).

Common bird species and grassland butterfly species continue to decline in Europe

Changes in land use and overuse of ecosystems can harm biodiversity. As biodiversity supports all ecosystem functions by contributing to their capacity to provide ecosystem services ([53]), monitoring efforts are vital to preserving and restoring biodiversity levels. Birds are sensitive to both human-induced and natural environmental change, making them good indicators of wider ecosystem health. Their widespread, diverse and mobile habitats make them ideal for monitoring the results of conservation efforts ([54]).



Between 2000 and 2015, common bird species in the EU declined by

0.6 %

The EU common bird index tracks population abundance and diversity of a selection of common bird species in the EU, typified by common forest and farmland bird species. Between 1990 and 2015, common bird species have declined by 10.3 %. Most of this decline took place before 2000, with the index remaining rather stable since then, showing a slight decline of 0.6 % between 2000 and 2015. Stronger declines are apparent for common farmland birds, which have fallen by 29.7 % since 1990, half of which (15.8 %) has occurred since 2000. This decline has largely been attributed to agricultural intensification, which has reduced natural nesting habitats through the removal of hedges, drainage of wetlands and the planting of previously uncultivated areas such as meadows and fallow fields. Agro-chemicals and changes in ploughing times for cereals have also affected common farmland birds, reducing their habitats, disrupting their breeding and decreasing available food sources ([55]). Since 2010, improvements in all common bird species can be seen, with an increase of 3.4 %, while the index for common farmland birds has remained more or less stable.

Between 2000 and 2015, grassland butterfly populations in Europe shrank by

17.0 %

While birds make great biodiversity indicators, butterflies can also act as signals of environmental and habitat health. The grassland butterfly index is based on data from 15 Member States, measuring the population trends of 17 butterfly species within the national Butterfly Monitoring Schemes ([63]). According to estimates from these monitoring efforts, butterfly populations declined by more than 33 % between 1990 and 2015, signifying a dramatic loss of grassland biodiversity. Between 2000 and 2015, the grassland butterfly index fell by 17.0 %. Causes for this decline can be attributed to changes in rural land use, in particular stemming from agricultural intensification as well as land abandonment in mountains and wet regions, mainly in eastern and southern Europe. Loss of semi-natural grasslands has been particularly detrimental ([64]).

In June 2018, the European Commission adopted the first-ever EU Initiative on Pollinators ([61]). The initiative sets the framework for an integrated approach to address the problem of declining pollinators in the EU and for a more effective use of existing tools and policies. The initiative aims to (a) improve knowledge of pollinator decline (both wild and domesticated pollinator species), its causes and consequences; (b) tackle these causes of pollinator decline; and (c) raise awareness, engage society-at-large and promote stakeholder collaboration ([62]).

The EU Birds Directive ([56]) protects all wild bird species and their habitats across the EU. The Habitats Directive ([57]) introduces very similar measures but extends its coverage to more than 1 200 other rare, threatened or endemic species of wild animals and plants. It also protects 231 rare habitat types in their own right. Under the EU Biodiversity Strategy to 2020 ([58]), these Nature Directives should be fully implemented in an effort to halt and reverse the trends of biodiversity loss. In 2015, the European Commission published the mid-term review of the EU Biodiversity Strategy to 2020, reporting on the progress towards the EU biodiversity targets ([59]).

Funding through the LIFE+ programme has been made available to encourage nature conservation in Member States. Additional funding is also available for farmers through the European Agricultural Fund for Rural Development ([60]) to implement farming practices aimed at addressing biodiversity loss.

Presentation of the main indicators

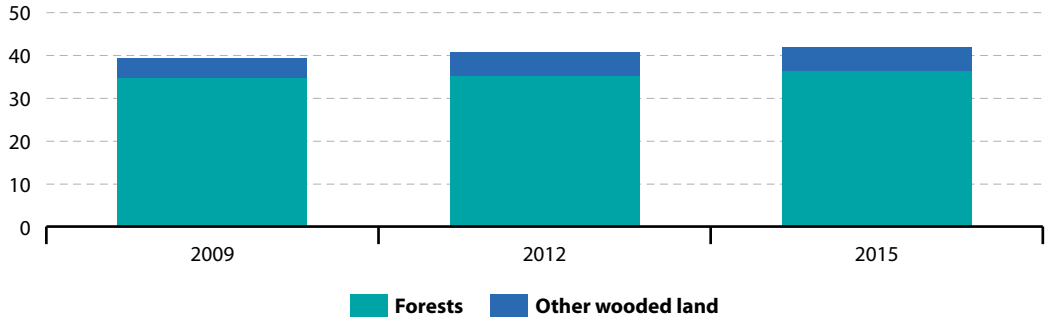
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2009–2015

Share of forest area

Forest area as a proportion of total land area provides information on the extent of forest ecosystems in the EU in comparison to other land cover classes; it does not provide any information about the condition of these areas. Data are derived from the Land Use and Cover Area frame Survey (LUCAS) collected by Eurostat every three years ([65]).

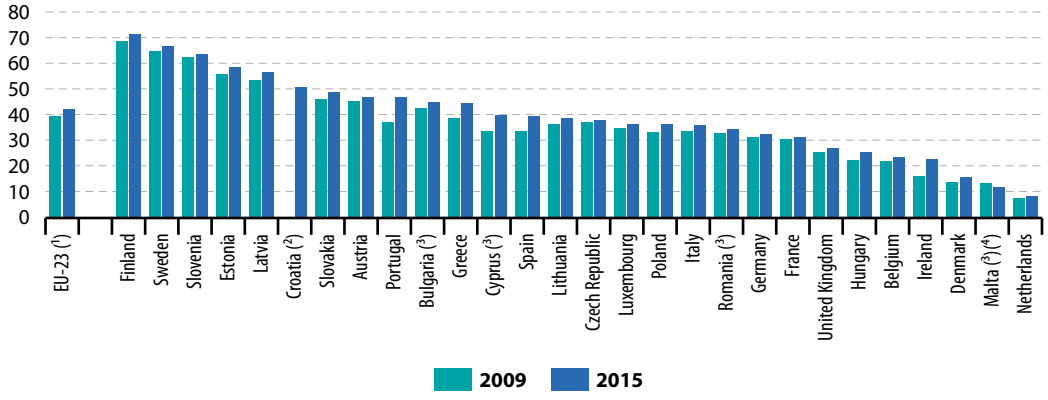
Figure 15.1: Share of forest area, EU, 2009, 2012 and 2015
(% of total land area)



Note: Data refer to EU-23 excluding Bulgaria, Cyprus, Croatia, Malta and Romania; 2009 data are provisional.
Source: Eurostat (online data code: sdg_15_10)

Between 2009 and 2015, the EU's share of forested area rose from 39.3 % to 41.9 %. This represents an average annual growth rate of 1.1 % per year. Over this period, the share of 'forests' grew slightly stronger, by 1.6 percentage points, than the share of 'other wooded land' (1.0 percentage points).

Figure 15.2: Share of forest area, by country, 2009 and 2015
(% of total land area)



Note: 2009 data are provisional for all countries.
(1) Not including Bulgaria, Cyprus, Croatia, Malta and Romania.
(2) No data for 2009.
(3) 2012 data (instead of 2009).
(4) Data have low reliability.

Source: Eurostat (online data code: sdg_15_10)

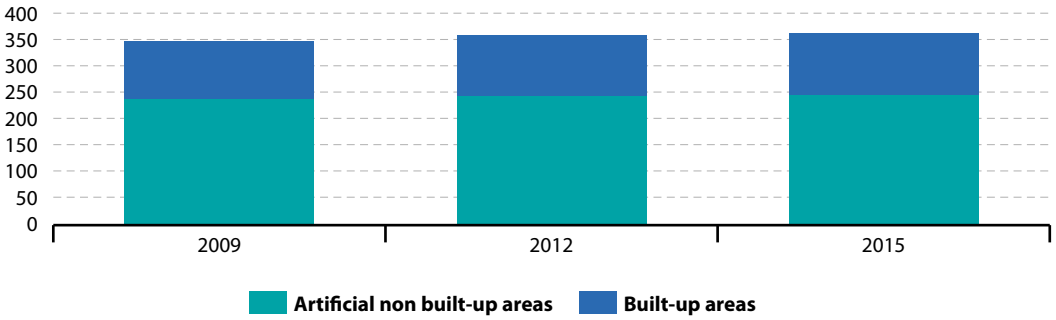
Artificial land cover per capita

LONG TERM
Insufficient data to calculate trend

SHORT TERM
2009–2015

Artificial land is defined as the total of artificial non-built up areas (such as parking lots, playgrounds, farms, cemeteries, roads, railways and bridges) as well as built-up areas (for example, buildings and greenhouses). Data for artificial land cover per capita are drawn from the Land Use and Cover Area Frame Survey (LUCAS) and give an indication of the intensity of land use in Europe.

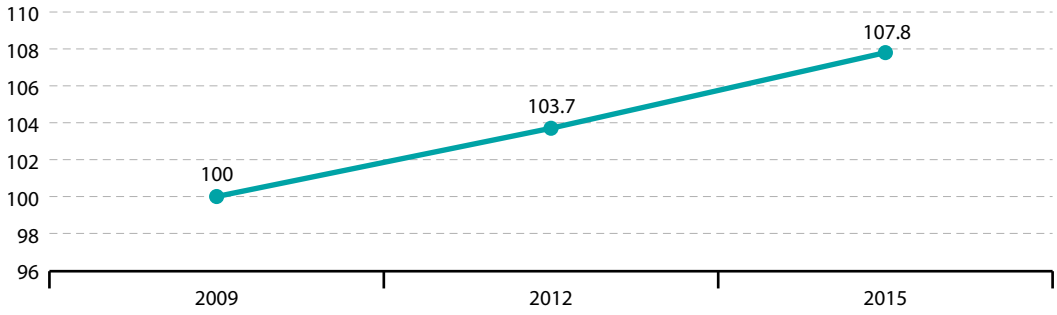
Figure 15.3: Artificial land cover per capita, by type, EU, 2009, 2012 and 2015
(m^2)



Note: Data refer to EU-23 excluding Bulgaria, Cyprus, Croatia, Malta, Romania.
Source: Eurostat (online data code: sdg_15_30)

Since 2009, the EU's area of artificial land cover per capita has increased by roughly 20 m^2 per capita, representing an overall growth rate in artificial land cover of 5.7 %. Between 2009 and 2015, artificial area per capita grew by an average of 0.9 % per year. The majority of this growth can be attributed to an increase in artificial non-built up areas, which saw an increase of 7.2 m^2 per person between 2009 and 2015.

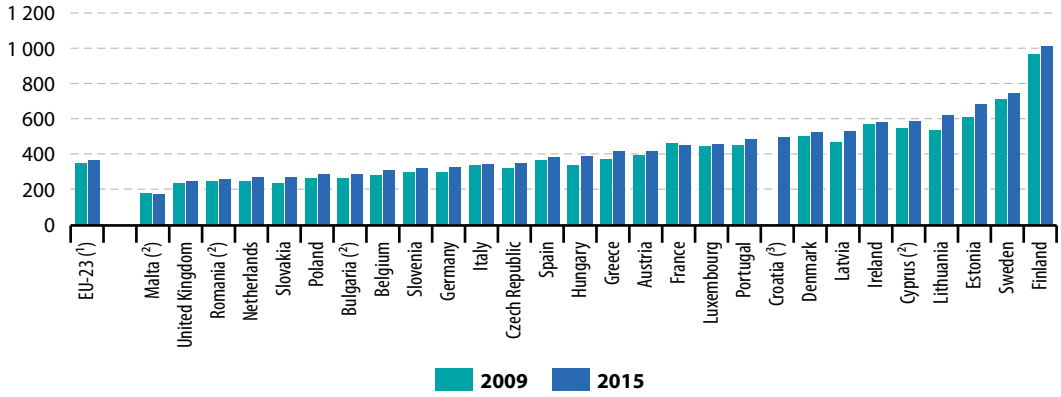
Figure 15.4: Change in artificial land cover, EU, 2009–2015
(index 2009 = 100)



Note: Data refer to EU-23 excluding Bulgaria, Cyprus, Croatia, Malta, Romania.
Source: Eurostat (online data code: sdg_15_30)

As indicated in Figure 15.4, conversion of surfaces into artificial areas has accelerated over time in the EU. While artificial land cover grew by 3.7 % between 2009 and 2012, the rate of change increased to 4.0 % for the period 2012 to 2015.

Figure 15.5: Artificial land cover per capita, by country, 2009 and 2015
(m^2)



(1) Not including Bulgaria, Cyprus, Croatia, Malta and Romania.
(2) 2012 data (instead of 2009).
(3) No data for 2009.

Source: Eurostat (online data code: sdg_15_30)

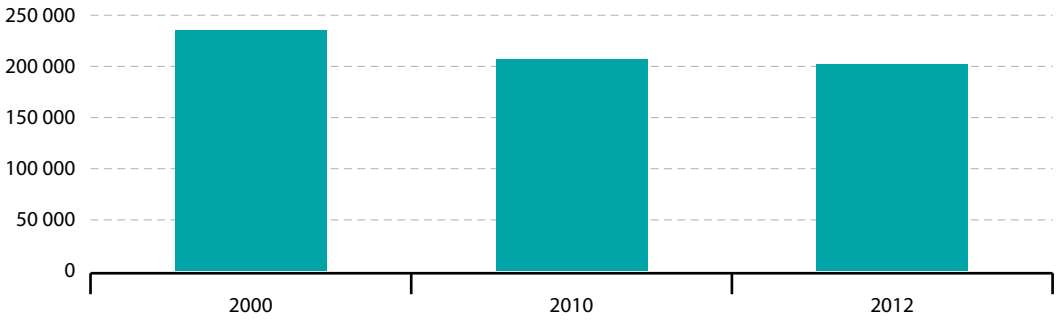
Estimated soil erosion by water

LONG TERM
2000–2012

SHORT TERM
Insufficient data to calculate trend

This indicator estimates the amount of soil lost by water erosion, such as from rainsplash, sheetwash and rills. This provides an indication of the area affected by a certain rate of soil erosion, though these numbers are estimated from soil erosion susceptibility models and should not be taken as measured values ([66]). Data presented in this section stem from the JRC's soil erosion database and focus on severe soil erosion (erosion rates higher than 10 t/ha/yr).

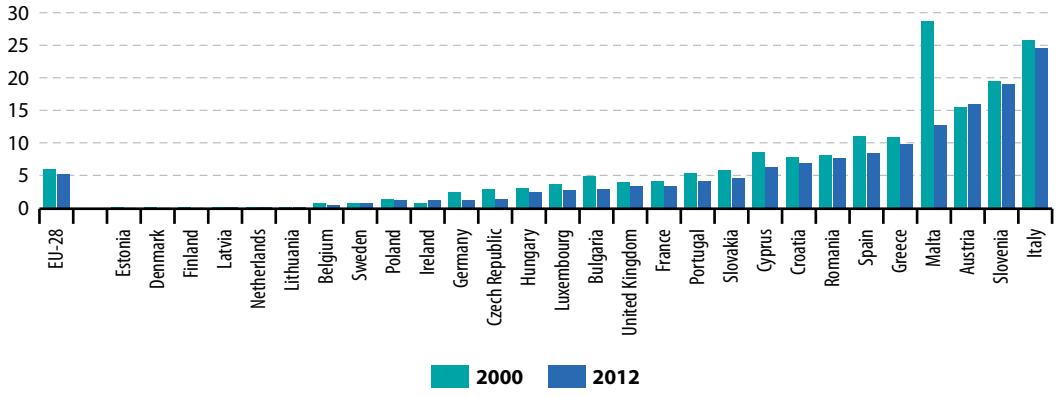
Figure 15.6: Estimated severe soil erosion by water, EU-28, 2000, 2010 and 2012
(km²)



Source: Joint Research Centre (Eurostat online data code: sdg_15_50)

Estimated severe soil erosion by water has steadily decreased since 2000 in the EU. Between 2000 and 2012, severe soil erosion by water has decreased overall by 14 % or 33 000 km², which represents an annual average decline rate of 1.2 %.

Figure 15.7: Estimated severe soil erosion by water, by country, 2000 and 2012
(% of the non-artificial erosive area)



Source: Joint Research Centre (Eurostat online data code: sdg_15_50)

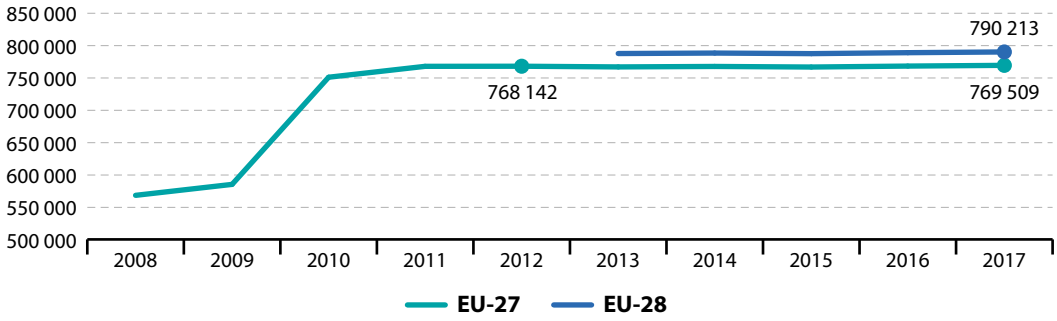
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2012–2017

Surface of terrestrial sites designated under Natura 2000

Terrestrial sites designated under the Natura 2000 network, constituting Special Protected Areas (SPAs) and Sites of Community Importance (SCIs), help protect habitats and species important for the EU. The area of these sites can provide an indication of the implementation of the Natura 2000 network, and the 'completeness' of its coverage within Member State territories. Data presented in this section stem from the EEA (European Environment Agency) and the ETC/BD (European Topic Centre for Biodiversity).

Figure 15.8: Surface of terrestrial sites designated under Natura 2000, EU-27 and EU-28, 2008–2017
(km²)



Source: European Commission services, European Environment Agency (Eurostat online data code: sdg_15_20)

Figure 15.8 above indicates the EU has steadily been increasing its terrestrial protected areas since 2008. The past few years have shown moderate fluxes, though the size of protected areas has remained above 766 000 km² for the EU-27 and above 787 000 km² for the EU-28. Due to a slight increase in 2017, the short-term annual growth rate for the EU-27 amounts to 0.04 % for the period from 2012 to 2017.

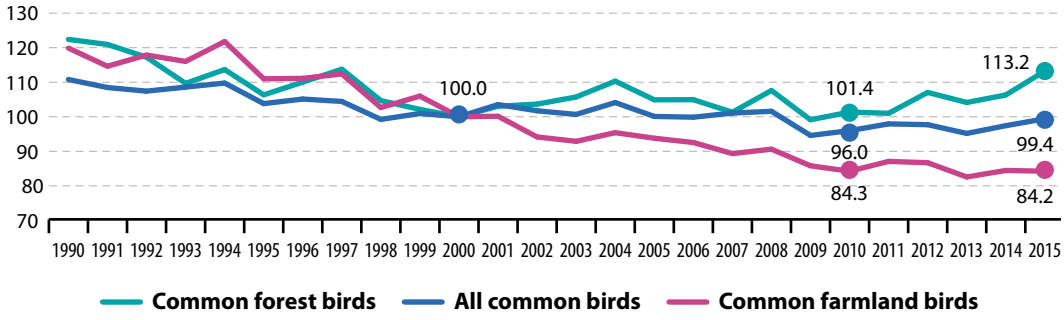
Common bird index

LONG TERM 2000–2015

SHORT TERM 2010–2015

This indicator is an index and integrates the abundance and the diversity of a selection of common bird species associated with specific habitats. Rare species are excluded. Three groups of bird species are represented: common farmland species (39 species), common forest species (34 species) and all common bird species (167 species). The index draws from data produced by the European Bird Census Council and its Pan-European Common Bird Monitoring Scheme programme. Data coverage has increased from 9 to 22 EU Member States over the period 1990 to 2010, with 25 countries covered as of the reference year 2011 ([67]).

Figure 15.9: Common bird index by type of species, EU, 1990–2015
(index 2000 = 100)



Note: The EU aggregate changes depending on countries joining the Pan-European Common Birds Monitoring Scheme.
Source: European Bird Census Council (EBCC)/BirdLife/Statistics Netherlands (Eurostat online data code: sdg_15_60)

Figure 15.9 shows that the three groups of common birds included in the index have developed quite differently since 2000. Between 2000 and 2015, the overall common birds index declined by 0.04 % per year on average. While the common farmland birds index fell by 1.1 % per year over this time span, the common forest birds index improved by 0.8 % a year. The short-term trend since 2010 has been more positive, with a 0.7 % annual increase in the all common birds index over 2010 to 2015. The index for common forest birds grew even faster by 2.2 % per year on average, while common farmland birds remained stable during this period.

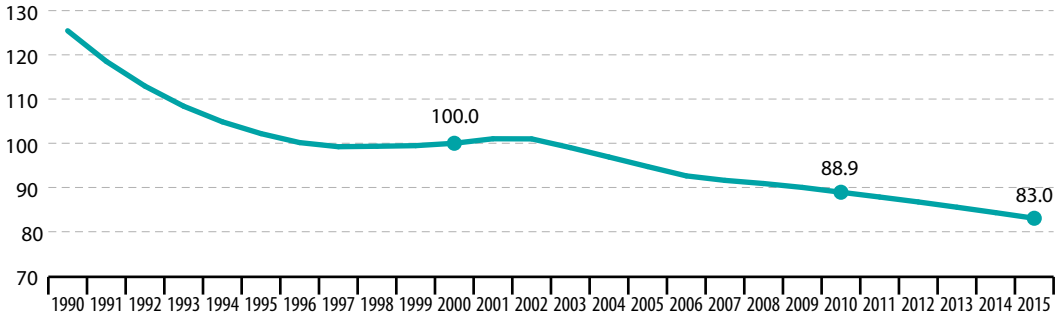
LONG TERM 2000–2015

SHORT TERM 2010–2015

Grassland butterfly index

Similar to the common bird index, the grassland butterfly index is a status indicator on biodiversity in Europe. It is based on data from 15 EU Member States (Belgium, Estonia, Finland, France, Germany, Ireland, Lithuania, Luxembourg, the Netherlands, Portugal, Romania, Slovenia, Spain, Sweden and the United Kingdom), measuring the population trends of 17 butterfly species ([68]). Data presented in this section stem from the European Environment Agency and Butterfly Conservation Europe/ Statistics Netherlands.

Figure 15.10: Grassland butterfly index, Europe, 1990-2015
(index 2000 = 100)



Source: European Environment Agency, Butterfly Conservation Europe, Statistics Netherlands (Eurostat online data code: sdg_15_61)

As Figure 15.10 shows, Europe's grassland butterfly population index has undergone a severe decline since 1990. After a period of stabilisation around the year 2000, the decline continued, with an annual average rate of 1.2 % over the long term (between 2000 and 2015). The loss in the index was slightly harsher over the short-term period (2010 to 2015), with an average annual decrease of 1.4 %.

Further reading on life on land

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European Environment Agency (2016), *European forest ecosystems — State and trends*, EEA Report No 5/2016, Copenhagen, EEA.

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FAO and ITPS (2018), *Soil pollution— a hidden reality*, Food and Agriculture Organization of the United Nations and Intergovernmental Technical Panel on Soils, Rome, FAO

Further data sources on life on land

European Environment Agency, Forest: growing stock, increment and fellings.

European Environment Agency, Land take.

European Environment Agency, Ecosystem coverage.

European Environment Agency, Species of European interest.

European Environment Agency, Habitats of European interest.

European Commission, European Soil Data Centre (ESDAC): Soil Threats Data.

Notes

(1) See e.g. European Commission (2015), *The Mid-term review of the EU Biodiversity Strategy to 2020*, COM(2015) 478 final, Brussels; and European Environment Agency (2015), The European Environment — state and outlook 2015, Copenhagen, EEA.
(2) European Environment Agency (2015), *Oxygen consuming substances in rivers.*
(3) FAO (2012), *Agriculture and water quality interactions: a global overview, SOLAW Background Thematic Report — TR08*, Food and Drug Administration, p. 15.
(4) *Ibid.*
(5) European Environment Agency (2017), *Nitrates in groundwater by country*.
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(7) European Commission (2016), *Water: Commission refers GERMANY to the Court of Justice of the EU over water pollution caused by nitrates*, European Commission Press Release Database.
(8) European Commission (2018), *Commission report on the implementation of the nitrates directive*, COM(2018) 257 final, p. 5.
(9) European Environment Agency (2015), *Nutrients in freshwater*.
(10) European Parliament and Council of the European Union (2010), *Directive 2000/60/EC establishing a framework for Community action in the field of water policy.*
(11) Council of the European Union (1998), *Directive 98/83/EC on the quality of water intended for human consumption*.
(12) Council of the European Communities (1991), *Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources*.
(13) Council of the European Communities (1991), *Directive 91/271/EEC concerning urban waste water treatment.*
(14) European Environment Agency (2015), *Nutrients in freshwater.*
(15) World Bank (2017), *Atlas of Sustainable Development Goals 2017: World Development Indicators*, Washington, DC: World Bank, p. 90; European Commission (2013), *A New EU Forest Strategy: for forests and the forest-based sector*, COM(2013) 659 final, p. 2.
(16) European Environment Agency (2016), *European forest ecosystems — State and trends*, EEA Report No 5/2016, Copenhagen, EEA.
(17) European Commission (2013), *A new EU Forest Strategy: for forests and the forest-based sector*, COM(2013) 659 final, Brussels.
(18) European Commission (2011), *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*, COM(2011) 244 final, Brussels.
(19) Council of the European Communities (1992), *Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora*.
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(21) Data refers to EU-23.
(22) Data stem from Eurostat's Land Use and Cover Area frame Survey (LUCAS) but apply the FAO forest categories.
(23) FAO (2015), *FRA 2015 — Terms and Definitions,* Rome, Food and Agriculture Organisation of the United Nations.
(24) European Environment Agency (2017), *Forest: growing stock, increment and fellings.*
(25) Ibid.
(26) Ibid.
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(28) European Commission (2012), *The implementation of the Soil Thematic Strategy and ongoing activities, COM(2012) 46 final*; FAO (2015), *Status of the World's Soil Resources*, Food and Drug Administration, Rome, Food and Agriculture Organization of the United Nations.
(29) European Environment Agency (2017), *Land take*; European Commission (2011), *Overview of best practices for limiting soil sealing or mitigating its effects in EU-27*, Ch. 2.
(30) European Environment Agency (2017), *Land take*.
(31) Ibid.
(32) European Environment Agency (2017), *Land take*; European Commission (2011), *Overview of best practices for limiting soil sealing or mitigating its effects in EU-27*, Ch. 2.
(33) Eurostat (2017), Statistics Explained: Land cover statistics.
(34) European Commission (2006), *Thematic Strategy for Soil Protection*, COM(2006) 231 final, Brussels.
(35) European Commission (2011), *Roadmap to a Resource Efficient Europe*, COM(2011), 571 final, Brussels.
(36) Eurostat (2017), Statistics Explained: Land cover statistics.
(37) European Commission Directorate General for the Environment (2016), *Soil sealing*.
(38) European Commission Directorate General for the Environment (2016), *Soil*.
(39) European Soil Data Centre (ESDAC) (2017), *Erosion by water*.
(40) Panagos, P., Borrelli, P., Poesen, J., Ballabio, C., Lugato, E., Meusburger, K., Montanarella, L. and Alewell, C. (2015), *The new assessment of soil erosion by water in Europe*, Environmental Science & Policy 54, 438–447

(41) Matthews, A. (2013), *Greening agricultural payments in the EU's Common Agricultural Policy*, Bio Based and Applied Economics, 2 (1) (2013), pp. 1–27.
(42) Eurostat (2018), *Statistics Explained: Agri-environmental indicator — soil erosion.*
(43) European Commission (2006), *Thematic Strategy for Soil Protection*, COM(2006) 231 final, Brussels.
(44) European Commission (2011), *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, Brussels.
(45) European Commission (2018), *Soil Organic Carbon Content.*
(46) European Environment Agency (2018), *Natura 2000 Barometer.*
(47) European Environment Agency (2017), *Species of European interest.*
(48) European Environment Agency (2018), *Habitats of European interest.*
(49) European Commission (2011), *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*, COM(2011) 244 final, Brussels.
(50) Council of the European Communities (1992), *Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.*
(51) European Parliament and Council of the European Union (2009), *Directive 2009/147/EC on the conservation of wild birds.*
(52) European Commission (2015), *Report from the Commission to the European Parliament and the Council — The mid-term review of the EU Biodiversity Strategy to 2020*, COM(2015) 478 final, Brussels.
(53) European Commission (2011), *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*, COM(2011) 244 final, Brussels.
(54) Eurostat (2018), *Statistics Explained, Biodiversity Statistics.*
(55) BirdLife International (2017), *The Vanishing: Europe's farmland birds*, published online by Iván Ramírez on 12 February 2017
(56) European Parliament and Council of the European Union (2009), *Directive 2009/147/EC on the conservation of wild birds.*
(57) Council of the European Communities (1992), *Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.*
(58) European Commission (2011), *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*, COM(2011) 244 final, Brussels.
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(60) European Parliament and Council of the European Union (2013), *Regulation (EU) No 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005.*
(61) European Commission (2018), *EU Pollinators Initiative, COM(2018) 395 final, Brussels.*
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(63) European Environment Agency (2018), *Common birds and butterflies.*
(64) European Environment Agency (2013), *The European Grassland Butterfly Indicator: 1990–2011*, Technical Report No 11/2013, Copenhagen, EEA.
(65) See Eurostat, *Statistics Explained: LUCAS — Land use and land cover survey.*
(66) Eurostat (2018), *Statistics Explained, Agri-environmental indicator — soil erosion.*
(67) Eurostat (2018), *Metadata Biodiversity (env_biodiv).*
(68) European Environment Agency (2013), *The European Grassland Butterfly Indicator: 1990–2011*, Technical Report No 11/2013, Copenhagen, EEA.

16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 16 calls for peaceful and inclusive societies based on respect for human rights, protection of the most vulnerable, the rule of law and good governance at all levels. It also envisions transparent, effective and accountable institutions.

eurostat supports the SDGs

The European Union has been one of the most successful peace projects in the world. Under the guidance of the Treaty of Rome ([1]), signed in 1957, the Union can look back on 60 years of peace, democracy and solidarity. In 2012, the EU was awarded the Nobel Peace Prize for advancing the causes of peace, reconciliation, democracy and human rights in Europe. Effective justice systems play a crucial role in upholding the rule of law and the EU's fundamental values. Despite these values being instated and protected in the EU by the rule of law and reinforced by the European Commission, crime still remains a threat to European citizens, businesses, state institutions, and to society as a whole. In particular, one of the biggest challenges for European societies is corruption, which compromises trust in democratic institutions and weakens the accountability of political leadership. The European Commission has been given a political mandate to monitor the fight against corruption and to develop a comprehensive EU anti-corruption policy.

Table 16.1: Indicators measuring progress towards SDG 16, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Peace and personal security			
Death rate due to homicide	↑ (1)	↑	page 304
Population reporting occurrence of crime, violence or vandalism in their area	:	↑	page 305
Physical and sexual violence to women experienced within 12 months prior to the interview (*)	:	:	SDG 5, page 107
Access to justice			
General government total expenditure on law courts	:	↗	page 306
Perceived independence of the justice system	:	:	page 307
Trust in institutions			
Corruption Perceptions Index	:	:	page 308
Population with confidence in EU institutions	↓	↗	page 309

(*) Multi-purpose indicator.
(1) Past 13-year period.

Table 16.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
🎯	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Peace, justice and strong institutions in the EU: overview and key trends

Monitoring SDG 16 in an EU context focuses on the topic areas of peace and personal security, access to justice and trust in institutions. While the indicators for which EU time series data are available paint a rather favourable picture for the past few years, a comprehensive assessment of the EU progress towards SDG 16 is not possible due to several gaps in the data.

Peace and personal security

Safety is a crucial aspect in people's lives. Insecurity is a common source of fear and worry, and negatively affects quality of life. Physical insecurity includes all the external factors that could potentially put an individual's physical integrity in danger. Criminal actions are one of the most obvious causes of insecurity. Analyses of physical insecurity usually combine two aspects: the subjective perception of insecurity and the objective lack of safety. Available time series on both objective and subjective measures of personal safety show a favourable trend in the EU over the past decade. A look at gender-related aspects, however, reveals that some important issues of concern remain.

The EU has become a safer place to live

Homicide is one of the most serious crimes. In the EU, deaths due to homicide have fallen steadily since 2002, reaching a rate of 0.7 deaths per 100 000 people in 2015. This corresponds to a reduction of 46.9 % over a 13-year period. The decline in homicides in the EU has gone hand in hand with improvements in people's perception of crime, violence or vandalism. Since 2007, the share of people reporting the occurrence of such problems in their area has generally fallen in the EU. In 2016, 13.0 % of the population felt affected by these issues, which is almost three percentage points less than in 2007.

The perception of being affected by crime, violence or vandalism differs strongly across socio-demographic sub-groups of the EU population. While 15.8 % of the population who were living below the poverty threshold, set at 60 % of the median equivalised income, felt affected by such problems in 2016, this was only the case for 12.5 % of the population above the poverty threshold. The differences are more pronounced across the sub-groups by the degree of urbanisation. With a reporting rate of 19.1 % in 2016, almost every fifth person living in cities felt affected by crime, violence or vandalism in the neighbourhood. In the more sparsely populated towns and suburbs and in rural areas reporting rates were much lower, at 10.8 % and 6.6 % of the population, respectively ([2]).

0.7
deaths per 100 000 people in the EU in 2015 were caused by homicides

The fear of victimisation paradox: when objective and subjective measures of physical insecurity don't match

National figures show that the perceived exposure to crime, violence or vandalism in 2016 was more than eight times higher in the most affected country (25.0 % of the population) than in the least affected country (3.0 %). However, country differences in this subjective indicator need to be treated with caution. Previous research suggests that crime rates from police registers and the subjective exposure to crime may differ, as population groups with low victimisation rates may be particularly afraid of crime (the so-called 'fear of victimisation' paradox) ([3]). This is, for instance, the case in the United Kingdom,

13.0 %
of the EU population reported crime, violence or vandalism in their area in 2016

which had the lowest death rate due to homicide across the EU, but one of the highest shares of people reporting occurrence of crime or other problems in their area (see Figures 16.2 and 16.4). In contrast, death rates due to homicide were among the highest in Lithuania, but the country had one of the lowest shares of people reporting crime, violence or vandalism in their neighbourhood. It should, however, be acknowledged that this comparison may not capture the full picture, as other forms of crime than homicide also contribute to perceived insecurity.

The European Agenda on security (4) sets out the main actions envisaged to ensure an effective EU response to terrorism and security threats in the European Union over the period 2015 to 2020. The Agenda identified three priorities: tackling terrorism and preventing radicalisation, disrupting organised crime, and fighting cybercrime. Other areas of EU intervention include the fight against trafficking in human beings and firearms, and the fight against corruption, financial crime and counterfeiting crime.

Men are more likely to die from homicide, while women more often fall victim to physical or sexual violence in their homes

Deaths due to homicide in the EU show a remarkable gender gap. While death rates due to homicide have fallen for both sexes, they remain about twice as high for men (0.9 deaths per 100 000 persons in 2015) as for women (0.5 deaths per 100 000 persons). However, while men have a higher overall risk of being killed than women, women have a significantly higher risk of being killed by their intimate partners or family members. A study by the United Nations Office on Drugs and Crime (UNODC) shows that 55 % of women who were killed fell victim to intimate partner- or family-related homicides in 2012, while this was only the case for 18 % of male homicides (5).

8 %

of women in the EU in 2012 had experienced physical or sexual violence during the past 12 months

Overall, according to the UNODC report, more than a quarter (28 %) of homicides in Europe were performed by an intimate partner or were family-related. Additionally, while the total homicide rate has fallen, the intimate partner- or family-related homicide rate has remained remarkably stable (6). This is an issue of concern, given that women are at a much higher risk of being killed by their partners or family members, and especially when considering the broader concept of violence against women, encompassing all forms of physical, sexual and psychological violence.

Gender-based violence is a brutal form of discrimination, related to inequalities between women and men. Physical and sexual violence against women does not only affect their health and well-being, but can also hamper their access to education and employment, negatively affecting their financial independence as well as the economy overall. In 2012, every third woman reported to have experienced some form of physical or sexual violence since the age of 15, and 8 % had experienced such violence in the 12 months prior to the survey (7).

Access to justice

Well-functioning justice systems are an important structural condition on which EU Member States base their sustainable growth and social stability policies. Whatever the model of the national justice system or the legal tradition in which it is anchored, quality, independence and efficiency are among the essential parameters of an 'effective justice system'. As there is no single agreed way of measuring the quality of justice systems, the budget actually spent on courts is used here as a proxy for the quality of the legal system. Moreover, judges in law courts need to be able to make decisions without interference or pressure from policy or other economic actors, to ensure

that individuals and businesses can fully enjoy their rights. The perceived independence of the justice system is used for monitoring this aspect. Data for the EU show a generally favourable trend over the past few years in both areas: the financial resources spent on law courts have increased (although at a slower pace than gross domestic product (GDP)), and the perceived independence of the justice system has improved.

EU expenditure on law courts has grown slower than GDP

In the EU, general government expenditure on law courts rose by 11.1 % between 2007 and 2016, reaching slightly more than EUR 50 billion in 2016. In per capita terms, this corresponds to an increase from EUR 90.2 per inhabitant in 2007 to EUR 97.9 per inhabitant in 2016, a growth rate of 8.5 %. However, putting these expenditures in relation to total government expenditure reveals that spending on law courts has remained stable at 0.7 % since 2012, a level slightly lower than the 0.8 % reported for the period 2007 to 2011. In relation to GDP, expenditure on law courts amounted to 0.4 % of GDP between 2008 and 2014, and fell to 0.3 % in 2015 and 2016 ([8]). The dynamics in government expenditure on law courts therefore do not reflect a stronger focus on the financing of law courts but merely mirror an increase in total government spending, which was slightly outperformed by growth in nominal GDP. This development can be attributed to governments consolidating their budgets following the financial crisis.

50 billion
euros were spent by governments on law courts across the EU in 2016

More than half of the EU population consider the justice system to be sufficiently independent

In 2018, 56 % of the EU inhabitants rated the independence of the courts and judges in their country as 'very good' or 'fairly good'. This represents an increase of four percentage points compared to 2016. At the same time, the perception of 'very bad' or 'fairly bad' fell by four percentage points, from 36 % to 32 %.

56 %
of the EU population rated the independence of courts and judges as very or fairly good in 2018

The most common reason for respondents rating the independence of their justice system as good was the status and position of judges sufficiently guaranteeing their independence. In contrast, interference or pressure from government and politicians were the most likely reasons for a bad rating ([9]).

Younger and higher-educated people as well as those who have not been to court have a better perception of the justice system's independence

While there are no major gender differences, age seems to have a notable effect on the perception of the independence of the justice system. The share of respondents' rating their justice system as good decreases with older age: while almost two-thirds (63 %) of 15- to 24-year-old respondents gave a good rating in 2018, only 52 % of respondents aged 55 or over had the same perception. Even more distinct differences were visible in terms of the length of time respondents had been in education. Those who had finished school at the age of 15 were more likely to have a negative perception of the independence of the justice system (41 % good, 39 % bad). In contrast, respondents studying until the age of 20 or longer had a more positive perception (62 % good). Moreover, employees (63 %) were more likely to give a good rating than self-employed people (54 %), manual workers (48 %) or not employed people (52 %). Notably, respondents who had been involved in a dispute that had gone to court were more evenly split between those who rated their system as good (52 %) and bad (44 %) than those who had not been to court (56 % good, 32 % bad) ([10]).

Improvement of the effectiveness of justice systems in Member States has been identified as a key component for structural reforms in the European Semester, the annual cycle for the co-ordination of economic policies at EU level. With the help of the Justice Scoreboard, the EU monitors the efficiency, quality and independence of the justice systems of the Member States.

Trust in institutions

Effective justice systems are a prerequisite for the fight against corruption. Corruption generally comprises illegal activities, which are deliberately hidden and only come to light through scandals, investigations or prosecutions. Corruption inflicts financial damage by lowering investment levels, hampering the fair operation of the internal market and reducing public finances. It also causes social harm as organised crime groups use corruption to commit other serious crimes, such as trafficking in drugs and humans. In a Communication from 2011, corruption was estimated to cost the EU economy EUR 120 billion per year, equivalent to about 1 % of the EU's GDP at that time ([11]). Corruption can also undermine trust in democratic institutions and weaken the accountability of political leadership. Available data on corruption and trust in institutions show that the EU has remained among the least corrupt regions in the world. Trust levels in the main EU institutions have nevertheless deteriorated since the early 2000s, although a turnaround was observed in the past few years.

EU Member States are among the least corrupt countries in the world

As there is no meaningful way to assess absolute levels of corruption in countries or territories on the basis of hard empirical evidence, capturing perceptions of corruption of those in a position to offer assessments of public sector corruption is so far the most reliable method of comparing relative corruption levels across countries. According to Transparency International's Corruption Perceptions Index (CPI), EU countries continued to rank among the least corrupt ones globally in 2017 and made up half of the global top 20 least-corrupt countries. Within the EU, northern European countries achieved the best scores, with Denmark, Finland and Sweden leading the ranking. Globally, Denmark and Finland ranked second and third in 2017, with New Zealand in the lead. On the other end of distribution, Bulgaria and Hungary showed the highest levels of perceived corruption across the EU. On the global list (comprising 180 countries in total), these two countries were ranked at position 71 and 66, respectively ([12]).

50 %
of the ten least corrupt countries in the world in 2017 were in the EU

The country ranking in the CPI largely corresponds to analogous answers collected in late 2017 through a Eurobarometer survey ([13]), in which Finland, Denmark and Sweden were identified as the countries where corruption was the least widespread. The responses collected through this survey, however, paint a more pessimistic picture than the CPI as regards the levels of corruption across the EU. In all but five countries, more than half of respondents considered corruption a widespread national problem. For the EU as a whole, this translates into an average of 68 % of respondents sharing this perception in late 2017. The perception of corruption as being a widespread phenomenon was generally higher for people in economically disadvantageous situations: those who were unemployed or who were struggling to pay their household bills were significantly more likely to think that corruption was widespread.

There also exists a notable relationship between the CPI and the perceived independence of the justice system (see page 301). Countries that score high in the CPI (such as Denmark, Finland or the Netherlands) also show a high share of the population rating the independence of the

justice system as 'good' (see Figures 16.8 and 16.9). Conversely, countries with less optimistic ratings of the justice system's independence also tend to have lower CPI scores, for example Bulgaria, Slovakia and Croatia. As both indicators are based on people's perceptions, however, a causal relationship between the effectiveness of the justice system and the occurrence of corruption cannot be implied based on these data. Effective justice systems are nevertheless considered as a prerequisite for fighting corruption ([14]).

Globally, the CPI reports a high corruption burden in more than two-thirds of countries

Globally, out of the 180 countries included in the CPI 2017, more than two-thirds scored below 50 on the scale from 0 (highly corrupt) to 100 (very clean). Looking at regional aggregates, western European countries were perceived to be the most clean in 2017 (average score of 66). Countries in Sub-Saharan Africa (average score of 32) and from eastern Europe and central Asia (average score of 34) were among the most corrupt. The 12 best countries on the global list had a score between 80 and 90 out of the maximum of 100, with New Zealand (score of 89), Denmark (score of 88) and Finland, Norway and Switzerland (score of 85 each) in the lead. In contrast, the three most corrupt countries according to the CPI were Somalia, South Sudan and Syria, with scores of 9, 12 and 14, respectively ([15]).

The deterioration of trust in EU institutions observable since the early 2000s has stopped in recent years

Confidence in political institutions is key for effective democracies. On the one hand, citizens' confidence increases the probability that they vote in democratic elections. On the other hand, it provides politicians and political parties with the necessary mandate to take decisions that are accepted in society.

Since the early 2000s, the EU has seen a considerable decline in levels of trust in three of its main institutions, the European Parliament, the European Commission and the European Central Bank. While in 2001 at least half of the EU population expressed their confidence in each of these three institutions, trust levels fell below 40 % for all three of them by 2013. More recent data however indicate a turnaround of this trend, with trust levels increasing between five and seven percentage points, depending on the institution, between 2013 and 2016.

45 %

of the EU population expressed trust in the European Parliament in 2017, making it the most trusted of the main EU institutions

The economic crisis may have played a role in the strong decline in trust in EU institutions observed between 2007 and 2013. On the one hand, a financial crisis can be seen as test of the EU's governance mechanisms. On the other hand, citizens tend to be much less acquainted with EU institutions compared with their own national or regional governments, making confidence in the EU much more dependent on extrinsic factors, such as contextual information, than on actual governance ([16]).

Throughout the years, the European Parliament has remained the most trusted of the three institutions surveyed. In 2016, 45 % of the EU population expressed confidence in the European Parliament, followed by 42 % for the European Commission and 39 % for the European Central Bank. Across EU Member States, the European Parliament was the most trusted of the surveyed EU institutions in all countries except for Finland and the Netherlands, where the European Central Bank was the most trusted, and Poland, where the European Commission received slightly higher trust levels.

Presentation of the main indicators

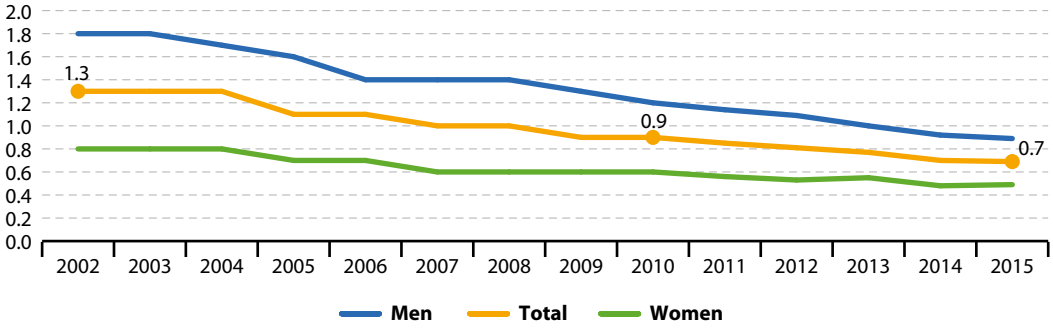
LONG TERM 2002–2015

SHORT TERM 2010–2015

Death rate due to homicide

This indicator tracks deaths due to homicide and injuries inflicted by another person with the intent to injure or kill by any means, including 'late effects' from assault (International Classification of Diseases (ICD) codes X85 to Y09 and Y87.1). It does not include deaths due to legal interventions or war (ICD codes Y35 and Y36). The data are presented as standardised death rates, meaning they are adjusted to a standard age distribution to measure death rates independently from the population's age structure.

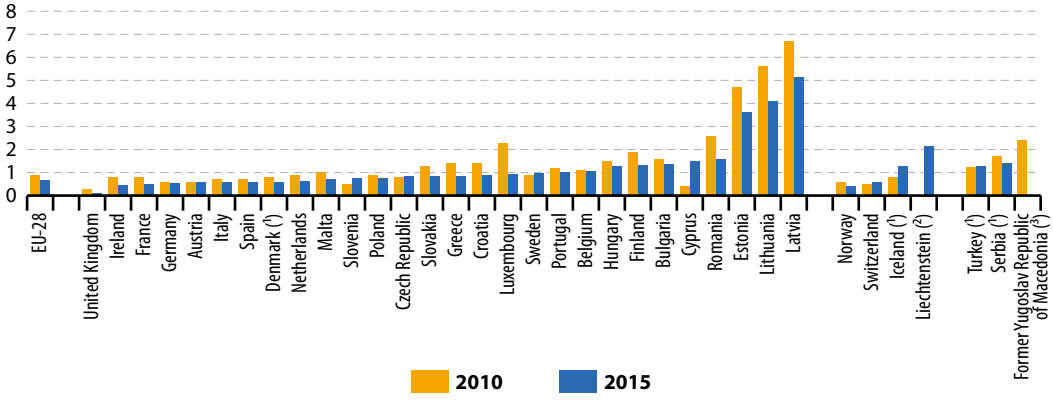
Figure 16.1: Death rate due to homicide, by sex, EU-28, 2002–2015
(number per 100 000 persons)



Source: Eurostat (online data code: sdg_16_10)

Fewer and fewer people in the EU are falling victim to homicide (see Figure 16.1). Over the long term, between 2002 and 2015, the number of deaths due to homicide per 100 000 persons fell by an average of 4.8 % per year. The decline has been slightly faster in the short term, since 2010, with an average fall of 5.2 % per year.

Figure 16.2: Death rate due to homicide, by country, 2010 and 2015
(number per 100 000 persons)



(1) 2011 data (instead of 2010). (2) 2014 data (instead of 2015); no data for 2010. (3) No data for 2015.

Source: Eurostat (online data code: sdg_16_10)

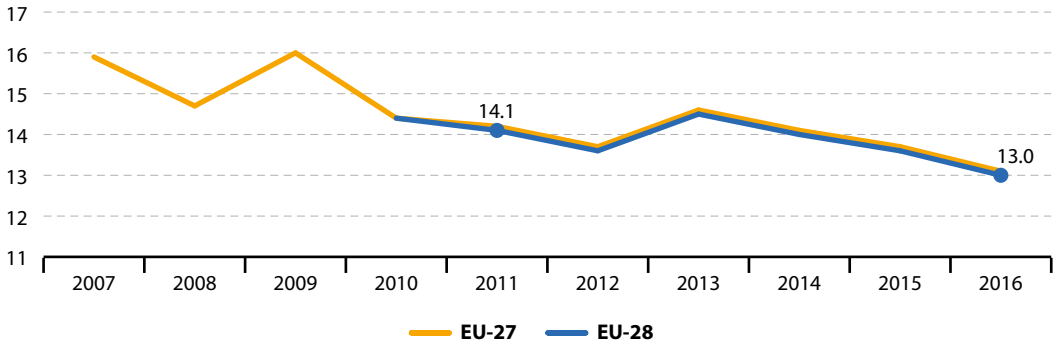
Population reporting occurrence of crime, violence or vandalism in their area

LONG TERM Insufficient data to calculate trend

SHORT TERM 2011–2016

This indicator shows the share of the population who reported they face the problem of crime, violence or vandalism in their local area. This describes the situation where the respondent feels crime, violence or vandalism in the area to be a problem for the household, although this perception is not necessarily based on personal experience. The data stem from the EU Statistics on Income and Living Conditions (EU-SILC).

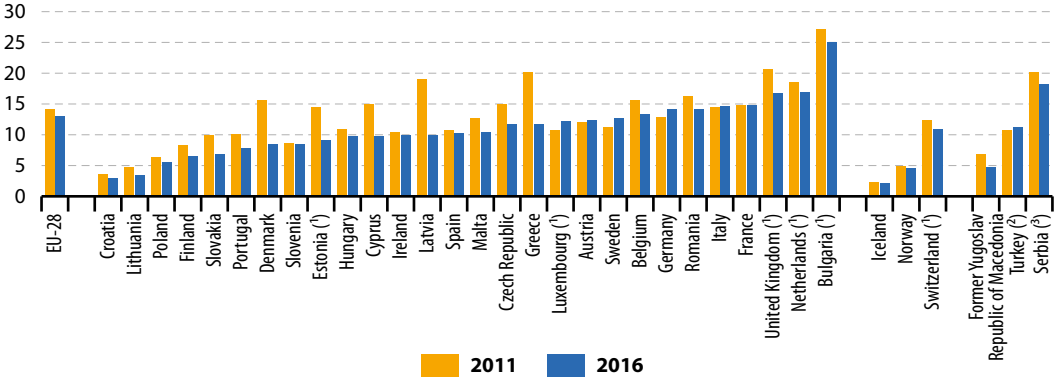
Figure 16.3: Population reporting occurrence of crime, violence or vandalism in their area, EU-27 and EU-28, 2007–2016
(% of population)



Source: Eurostat (online data code: sdg_16_20)

Figure 16.3 shows the perceived safety of EU neighbourhoods has improved over the past few years. In the short-term period from 2011 to 2016, the share of the population reporting occurrence of crime, violence or vandalism in their area fell by 1.6 % per year on average. Not enough data is available to calculate progress over a long-term period.

Figure 16.4: Population reporting occurrence of crime, violence or vandalism in their area, by country, 2011 and 2016
(% of population)



(1) Break(s) in time series between 2011 and 2016. (2) 2015 data (instead of 2016). (3) 2013 data (instead of 2011).

Source: Eurostat (online data code: sdg_16_20)

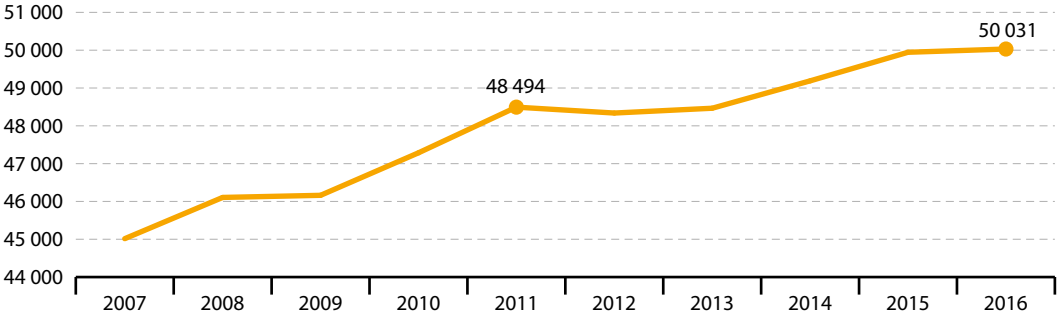
LONG TERM
Insufficient data to calculate trend

SHORT TERM
2011–2016

General government total expenditure on law courts

This indicator refers to the general government total expenditure on law courts. It includes expenditure on the administration, operation or support of civil and criminal law courts and the judicial system, including enforcement of fines and legal settlements imposed by the courts and operation of parole and probation systems, legal representation and advice on behalf of government or on behalf of others provided by government in cash or in services. Law courts include administrative tribunals, ombudsmen and the like and exclude prison administrations.

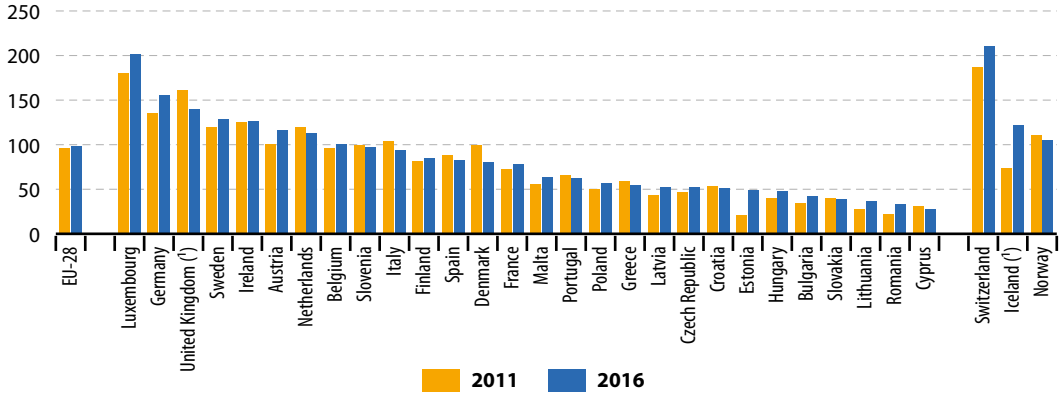
Figure 16.5: General government total expenditure on law courts, EU-28, 2007–2016
(million EUR)



Source: Eurostat (online data code: sdg_16_30)

General government expenditure on law courts has increased almost continuously since 2007. In the short-term period between 2011 and 2016, total spending in million EUR grew on average by 0.6 % annually. On a per capita basis (EUR per inhabitant), expenditure increased as well, but at a slower rate of 0.3 % per year over this period. When expressed as a share of GDP, however, the trend looks less favourable, with a drop of 0.1 percentage points from 0.4 % in 2011 to 0.3 % in 2016.

Figure 16.6: General government total expenditure on law courts, by country, 2011 and 2016
(EUR per capita)



(1) 2013 data (instead of 2011).

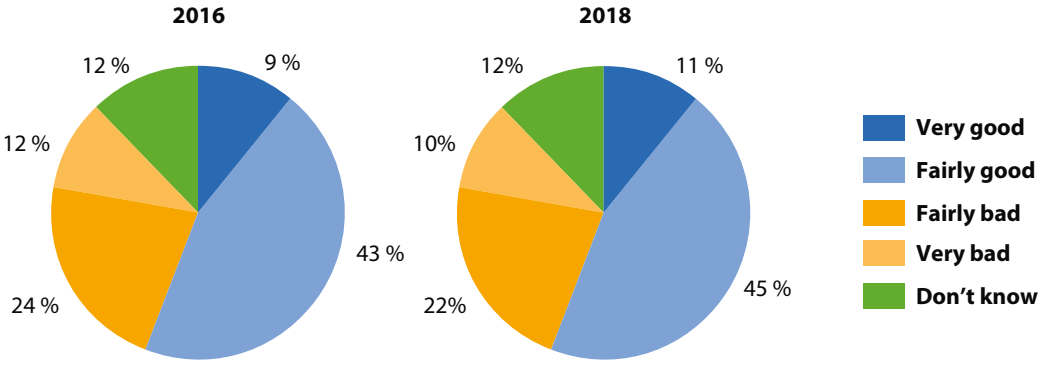
Source: Eurostat (online data code: sdg_16_30)

Perceived independence of the justice system

X Insufficient data to calculate trends

This indicator is designed to explore respondents' perceptions about the independence of the judiciary across EU Member States, looking specifically at the perceived independence of the courts and judges in a country. Data on the perceived independence of the justice system stem from annual Flash Eurobarometer surveys, which started in 2016 on behalf of the European Commission's Directorate-General for Justice and Consumers.

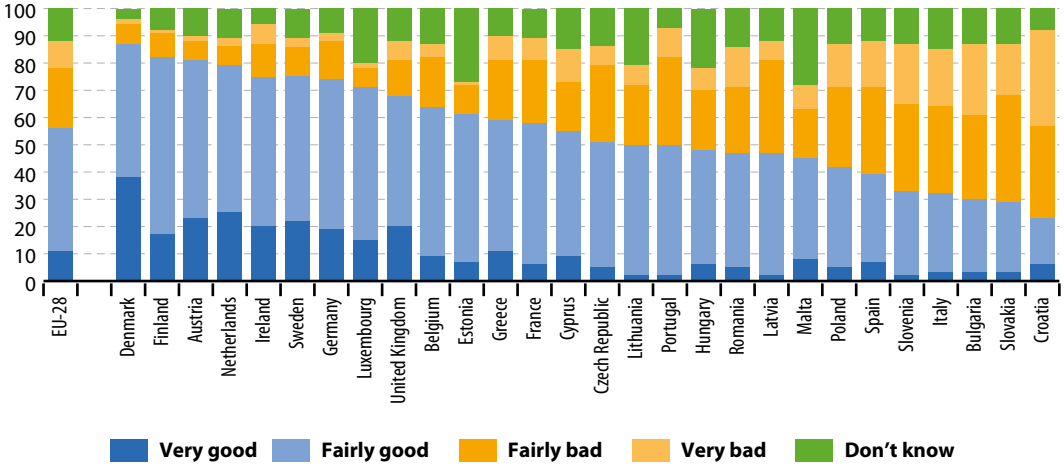
Figure 16.7: Perceived independence of the justice system, EU-28, 2016 and 2018
(% of population)



Source: European Commission services (online data code: sdg_16_40)

As shown in Figure 16.7, more than half of the EU population rated the independence of the justice system as very good or fairly good in 2016 and 2018. The perceived independence has improved slightly since 2016.

Figure 16.8: Perceived independence of the justice system, by country, 2018
(% of population)



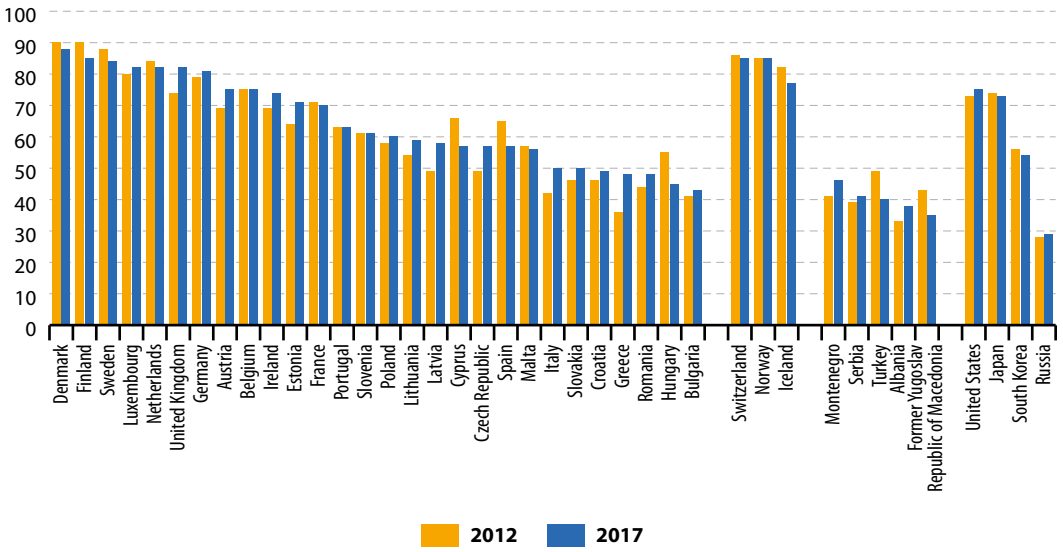
Source: European Commission services (online data code: sdg_16_40)

X Insufficient data to calculate trends

Corruption Perceptions Index

This indicator is a composite index based on a combination of surveys and assessments of corruption from 13 different sources and scores. It ranks countries based on how corrupt their public sector is perceived to be, with a score of 0 representing a very high level of corruption and a score of 100 representing a very clean country. The sources of information used for the Corruption Perceptions Index (CPI) are based on data gathered in the 24 months preceding the publication of the index. The CPI includes only sources that provide a score for a set of countries/territories and that measure perceptions of corruption in the public sector. For a country/territory to be included in the ranking, it must be included in a minimum of three of the CPI's data sources. The CPI is published by Transparency International.

Figure 16.9: Corruption Perceptions Index, by country, 2012 and 2017
(score scale of 0 (highly corrupt) to 100 (very clean))



Source: Transparency International (online data code: sdg_16_50)

Between 2012 and 2017, slightly more than half of the EU Member States (16 countries) improved their CPI score, while nine countries fell back in their scores. The most notable changes are reported for Greece (+ 12 points) and Hungary (– 10 points).

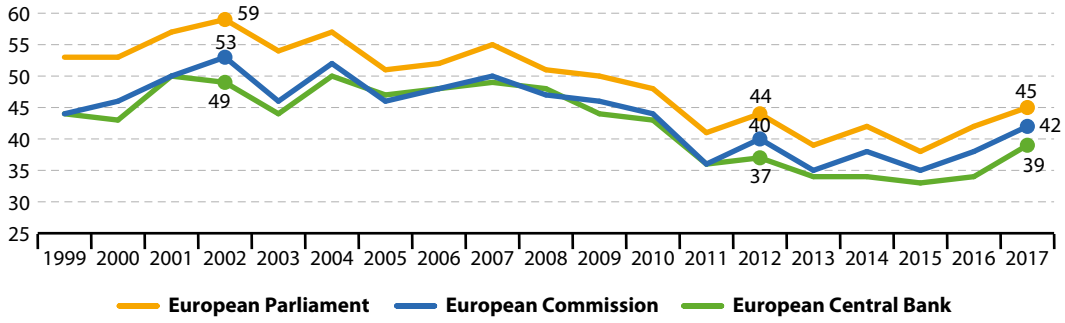
Population with confidence in EU institutions

LONG TERM 2002–2017

SHORT TERM 2012–2017

This indicator measures confidence among EU citizens in three EU institutions: the European Parliament, the European Commission and the European Central Bank. It is expressed as the share of positive opinions (people who declare that they tend to trust) about the institutions. Citizens are asked to express their confidence levels by choosing the following alternatives: 'tend to trust', 'tend not to trust' and 'don't know' or 'no answer'. The indicator is based on the Eurobarometer, a survey which has been conducted twice a year since 1973 to monitor the evolution of public opinion in Member States. The indicator only displays the results of the autumn survey.

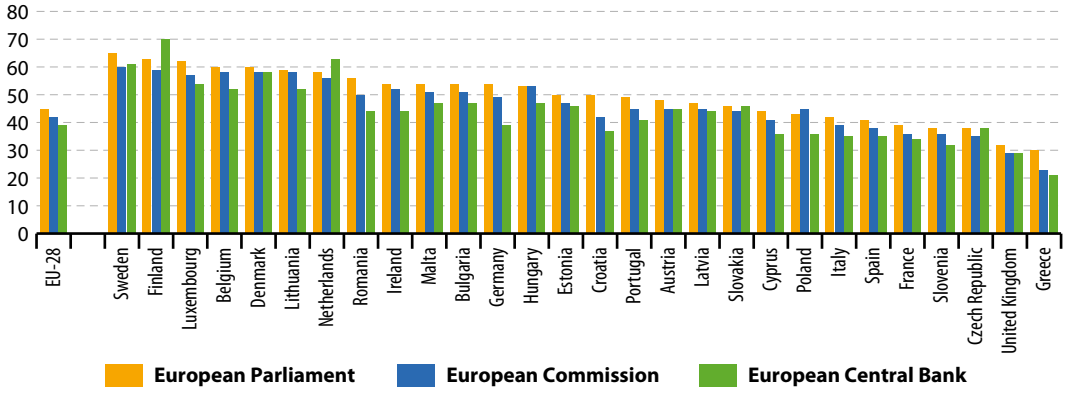
Figure 16.10: Population with confidence in EU institutions, by institution, EU-28, 1999–2017
(% of population)



Source: European Commission services (online data code: sdg_16_60)

As shown in Figure 16.10, the deterioration of trust in EU institutions observed since the early 2000s appears to have stopped in recent years. While the share of the population expressing confidence fell by between 1.5 % (European Central Bank) and 1.8 % (European Parliament) on average per year over the long-term period from 2002 to 2017, in the short-term period since 2012 trust levels grew by between 0.5 % (European Parliament) and 1.1 % (European Central Bank) per year on average.

Figure 16.11: Population with confidence in EU institutions, by institution and country, 2017
(% of population)



Source: European Commission services (online data code: sdg_16_60)

Further reading on peace, justice and strong institutions

European Commission (2018), *Flash Eurobarometer 461 Report on Perceived independence of the national justice systems in the EU among the general public*.

European Commission (2017), *Fight against corruption*, European Semester thematic factsheet.

European Commission (2017), *The 2017 EU Justice Scoreboard*, COM(2017) 167 final, Brussels.

European Research Centre for Anti-Corruption and State-Building (ERCAS) & Hertie School of Governance (2015), *Public integrity and trust in Europe*, Berlin.

UNODC (2014), *Global study on homicide 2013*, United Nations Office on Drugs and Crime, Vienna.

Further data sources on peace, justice and strong institutions

Eurostat, Crime and criminal justice statistics

UNODC, Global statistics on crime, criminal justice, drug trafficking and prices, drug production, and drug use

World Bank, Worldwide Governance Indicators

Notes

(1) Signed in Rome in 1957 as the Treaty establishing the European Economic Community, it is now known as Treaty on the Functioning of the European Union.
(2) Source: Eurostat (online data code: ilc_mddw06).
(3) See for example: Rader, N. (2017), *Fear of Crime, Oxford Research Encyclopedia of Criminology*.
(4) European Commission (2015), The European Agenda on Security, COM(2015) 185 final, Strasbourg.
(5) UNODC (2014), *Global study on homicide 2013, Vienna: United Nations Office on Drugs and Crime*, p. 49 ff.
(6) Ibid.
(7) European Union Agency for Fundamental Rights (FRA), *Violence against women survey*.
(8) Source: Eurostat (online data code: gov_10a_exp).
(9) European Commission (2018), *Flash Eurobarometer 461 Report on Perceived independence of the national justice systems in the EU among the general public*, p. 4.
(10) *Id.*, p. 10.
(11) European Commission (2014), EU anti-corruption report, COM(2014) 38 final, p. 3.
(12) Transparency International (2018), *Corruption Perceptions Index 2017*.
(13) European Commission (2017), *Special Eurobarometer 470 on Corruption*, p. 16ff.
(14) Also see European Commission (2016), *European Semester Thematic Factsheet on Effective Justice Systems*, accessed 28 March 2018.
(15) Transparency International (2018), *Corruption Perceptions Index 2017*.
(16) European Research Centre for Anti-Corruption and State-Building (ERCAS) & Hertie School of Governance (2015), *Public integrity and trust in Europe*, Berlin, p. 19.

17 Strengthen the means of implementation and revitalise the global partnership for sustainable development

Goal 17 calls for a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the WTO and the implementation of duty-free and quota-free market access for all least developed countries. The goal highlights the importance of global macroeconomic stability and the need to mobilise financial resources for developing countries from international sources as well as through strengthened domestic capacities for revenue collection.

eurostat supports the SDGs

The world today is more interconnected than ever before. The SDGs can only be realised with a strong commitment to global partnership and cooperation. Coordinating policies to help developing countries manage their debt, as well as promoting investment for the least developed ones, is vital to achieving sustainable growth and development. The EU has long been committed to global partnership by supporting less-developed economies through official development assistance. Over the past decade, there has been a shift in the balance of roles, from donor-recipient towards a more equal partnership. The EU has been strongly involved in processes such as the Busan Partnership for Effective Development Cooperation and the Nairobi High level Meeting of the Global Partnership. However, to help others, the EU also has to ensure its own financial stability and to focus on the financial governance of its Member States.

Table 17.1: Indicators measuring progress towards SDG 17, EU-28

Indicator	Long-term trend (past 15 years)	Short-term trend (past 5 years)	Where to find out more
Global partnership			
Official development assistance as share of gross national income	↗ (1)	↑	page 321
EU financing to developing countries	↑	↓	page 323
EU Imports from developing countries	↑	↑	page 324
Financial governance within the EU			
General government gross debt	↓	↗	page 325
Shares of environmental and labour taxes in total tax revenues	↘ (2)(3)	↘ (3)	page 326

(1) Past 12-year period.
(2) Past 14-year period.
(3) Calculation of trend based on shares of environmental taxes in total revenues from taxes and social contributions (excluding imputed social contributions) only.

Table 17.2: Explanation of symbols for indicating progress towards SD objectives and targets

Symbol	With quantitative target	Without quantitative target
	Trends for indicators marked with this 'target' symbol are calculated against an official and quantified EU policy target. In this case the arrow symbols should be interpreted according to the left-hand column below. Trends for all other indicators should be interpreted according to the right-hand column below.	
↑	Significant progress towards the EU target	Significant progress towards SD objectives
↗	Moderate progress towards the EU target	Moderate progress towards SD objectives
↘	Insufficient progress towards the EU target	Moderate movement away from SD objectives
↓	Movement away from the EU target	Significant movement away from SD objectives
:	Calculation of trend not possible (for example, time series too short)	

Note: The two methods for calculating progress used in this report are explained in more detail in the introduction and in the annex; for an overview of the considered policy targets see Table II.18 in the annex.

Partnership for the goals in the EU: overview and key trends

Monitoring SDG 17 in an EU context focuses on global partnership and financial governance within the EU. While the EU has achieved some progress in the area of global partnership, financial flows to developing countries have decreased over the past few years. The progress in the sphere of financial governance within the EU has been less favourable.

Global partnership

In an interconnected world, relationships can no longer be limited to North–South or state-to-state connections. To achieve the ambition of the 2030 Agenda, cooperative and strong partnerships are necessary at all levels and between different governments, the private sector and civil society. The EU has taken steps in this direction with the creation of a multi-stakeholder platform on the SDGs ([1]), with the aim to support and advise the European Commission on the implementation of SDGs at the EU level.

Advanced economies such as the EU can support the implementation of the 2030 Agenda in developing countries through the mobilisation of public and private, domestic and international resources. These resources can be both financial and non-financial ([2]), although this chapter focuses on the former. Overall, the trends shown by the indicators chosen for the global partnership paint a rather favourable picture for the EU over the past few years. For instance, trade relations with developing countries have intensified.

The EU supports country-led development through a range of financial support mechanisms

In 2015, in the Addis Ababa Action Agenda (AAAA), all countries, including EU Member States, recognised that international public finance plays an important role in complementing countries' efforts to mobilise public resources domestically, especially in the poorest and most vulnerable countries with limited domestic resources. Official development assistance (ODA), other official flows (OOFs), private flows, such as foreign direct investment (FDI), and grants by NGOs are different types of financial flows from the EU and its Member States to developing countries. The EU's financial assistance supports the 2030 Agenda by helping reduce poverty and vulnerability and improve well-being and development.

145

billion EUR were spent by the EU on financing to developing countries in 2016

A positive trend regarding the total volume of financial flows from the EU to developing countries has been visible over the past two decades. The OECD estimates that total EU financing to developing countries, comprising flows from the public and private sector, amounted to EUR 144.7 billion in 2016. This is more than 2.5 times as high as the financial flows in 2001 and almost four times higher than in 2002, when financing to developing countries experienced a trough, at only EUR 38.8 billion. However, due to a decline in private flows in 2016 compared with previous years, the short-term trend over the period 2011 to 2016 is slightly unfavourable.

While OOFs and grants by non-governmental organisations (NGOs) have remained at a rather marginal level, ODA and private flows combined have accounted for a share of more than 95 % in total financing for development since 2006. Private flows, however, have experienced a huge variation over the years, ranging from only 0.8 % of total financing in 2002 to 69.0 % in 2007. Therefore, ODA can be seen as the most reliable and steady financial flow from the EU to developing countries ([3]).

Official development assistance: a long struggle to meet targets

The idea that donor countries should contribute 0.7 % of their gross national income (GNI) to ODA has been on the international agenda for nearly half a century ([4]). This target, originally set for 1975, was missed again in 2015 and was only met by four EU Member States in 2017. As a whole, the EU spent 0.5 % of its GNI on ODA in 2017, after having stagnated close to 0.4 % of GNI for the period 2005 to 2014. The increase between 2014 and 2017 by almost 0.1 percentage points is partly linked to the recent refugee crisis, as donor countries are allowed to count certain expenses for refugees for the first year after the refugees' arrival as ODA. Thus, on the one hand, the extent of the recent refugee crisis is one reason why ODA saw such an increase in 2015 and 2016. On the other hand, collective EU ODA increased by 10 % in 2016 even when excluding donor refugee costs ([5]). For 2017, however, figures show a 2.4 % decrease of EU collective ODA compared to 2016 ([6]). The EU ODA/GNI ratio for 2017 stood at 0.50 %, down from 0.53 % in 2016. A decline in in-donor refugee costs contributed to this fall in EU collective ODA in 2017.

0.5 %
of the EU's gross national income was spent for ODA in 2017

ODA as a share of GNI is intrinsically linked to the EU's economic situation. This became particularly visible when overall flows fell during the economic downturn in 2008 and its aftermath, while the actual ratio of ODA to GNI did not change significantly. With several developments expected in the years ahead (for example, the withdrawal of the United Kingdom from the EU) there may be further negative effects on progress. Despite these challenges, the EU continues to commit itself to the 0.7 % target. Building on the EU Council Conclusions from 2015 ([7]), the new European Consensus on Development ([8]), signed in June 2017, reaffirms the EU target of providing 0.7 % of its GNI as ODA, this time by 2030. However, with only four EU countries having achieved this target in 2017, additional efforts will be needed from a majority of Member States to meet the renewed collective commitment.

EU Member States acknowledged in the Addis Ababa Action Agenda (AAAA) ([9]) in 2015 that international financial support could help activating financial resources domestically.

The EU remains the biggest ODA donor in the world

In 2017, the EU maintained its position as the biggest ODA donor globally, providing EUR 75.7 billion ([10]). This figure refers to the combined ODA provided by all EU Member States and the non-imputed spending by the EU institutions.

Additionally, with 0.5 % in 2017, the overall EU ODA/GNI ratio was significantly higher than for most other OECD donors such as Canada, Japan or the United States. At the same time, aid from emerging donors is increasing. For example, the United Arab Emirates spent 1.31 % of its GNI on ODA, which was the highest ratio for a country reporting to the Development Assistance Committee (DAC) in 2017 ([11]).

The EU particularly supports least developed countries

To target resources where they are most needed — least developed countries (LDCs) and countries in states of fragility and conflict — the EU also has a target to collectively provide 0.15–0.20 % of GNI to LDCs in the short term,

The European Consensus on Development ([12]) signed in June 2017 outlines the need to dedicate a high proportion of official development assistance to least developed countries and other low-income countries (OLICs). Hence, 0.15 % of gross national income in the short term, rising to 0.20 % by 2030, should be allocated to least developed countries. This commitment is also set out in EU Council Conclusions from 2018 ([13]).

reaching 0.20 % within the timeframe of the 2030 Agenda. Between 2000 and 2015, out of all country groups that were listed on the DAC's lists of ODA recipients, growth in the EU's assistance was slowest for LDCs. The Consensus takes a comprehensive approach to implementation, combining aid with other resources, with sound policies and a strengthened approach to Policy Coherence for Development. It puts emphasis on better-tailored partnerships with a broader range of stakeholders and partner countries. Data show that EU aid to LDCs has been stagnating at 0.11 % of GNI and further efforts will be needed from a majority of Member States to meet the collective commitment by 2030.

The EU seeks coherence between all financial flows to developing countries

The EU seeks to pursue a coherent approach so that developing countries can combine aid, investment and trade with domestic resources and policies to build capacity and support self-reliance. ODA, for example, can be used to mobilise other financial resources such as domestic taxes or foreign investment, thus unlocking trade and private financing. Other innovative instruments have been developed, such as blending grants with loans or equity from public and private financiers, to reduce risks. Resources can also come from developing countries' own national tax systems; the EU provides support to improve the mobilisation of these domestic resources.

The financial support offered by the EU, combined with domestic financial flows, provides a strong basis for achieving the goals of the 2030 Agenda, allowing for investment in social services, clean energy, sustainable infrastructure, transport and information and communications technologies. In the best-case scenario, developing countries could leapfrog some of the unsustainable modes of production and consumption that were — and still are — visible in industrialised countries.

The fastest growing type of bilateral ODA between 2000 and 2015 was for 'economic infrastructure and services', with an annual growth rate as high as 11.7 %. In contrast, bilateral ODA for 'action related to debt' decreased by 11.4 % annually during the same time period, making up only 0.7 % of total ODA in 2015, although a growing number of countries are being confronted with debt distress ([14]). ODA related to 'social infrastructure and services' made up the largest share of bilateral ODA throughout the years, accounting for almost one-third (31.2 %) in 2015.

EU imports from developing countries have more than doubled

The potential contribution of trade to sustainable development has long been acknowledged. This is also reflected in the EU's trade and investment strategy 'Trade for All' ([15]), adopted in 2015. Exports can create domestic jobs and allow developing

957

billion EUR was the value of EU imports from developing countries in 2017

The EU places an emphasis on coherence between all financial flows to developing countries, trying to bring together aid, investment, trade, domestic resource mobilisation and effective policies. For instance, the EU has a flagship Domestic Resource Mobilisation support programme, which aims to establish efficient, effective, transparent and fair tax systems in developing countries. The EU also uses its blending facilities and its External Investment Plan to help mobilise private sector financing and maintains 'duty free and quota free' market access to LDCs as set out in the Addis Ababa Action Agenda (AAAA) ([16]). Both the 2030 Agenda and the AAAA underscore the importance of science, technology and innovation as powerful drivers for sustainable development. International cooperation in these areas is indispensable for the achievement of all SDGs.

The EU's unilateral preferential trade arrangement, 'Generalised Scheme of Preferences' (GSP) ([17]) allows developing countries to pay less or no duties on their exports to the EU. The Everything But Arms (EBA) arrangement, which is part of the GSP, grants full duty-free, quota-free access for all LDC products except arms and ammunition. The EU also provides significant amounts of 'aid for trade' ([18]), with the aim of supporting trade-related infrastructure and building productive capacity.

countries to obtain foreign currency, which they can use to import other goods needed either for consumption or production. Better integration of developing countries into world markets may thus reduce the need for external public flows such as ODA. Several of the SDGs refer to the importance of trade for sustainable development, with SDG 8 calling on countries to increase aid for trade, particularly for LDCs, and SDG 17 calling, among others, on countries to 'significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020'.

Since 2002, EU imports from developing countries more than doubled, from EUR 359 billion to EUR 957 billion in 2017. In the long term, EU imports from developing countries grew by 6.8 % per year on average. In the short term since 2012, imports still grew, but less intensely so, with a growth rate of 2.1 % per year. The share of imports from developing countries to the EU in imports from all countries outside the EU increased from 38.3 % in 2002 to 51.5 % in 2017. China (excluding Hong Kong) alone accounted for 39.2 % of EU imports from developing countries in 2017. The share of imports from least developed countries increased between 2002 and 2017, at a slightly higher rate than that for all developing countries. Overall, the almost 50 countries classified as least developed by the UN accounted for only 2.0 % of all imports to the EU in 2017 ([19]).

While the share of LDCs in world merchandise and commercial services exports remains far too low, there are some positive signs for a potential recovery driven by access to EU markets. Firstly, over the past few years the EU strengthened its role as the main export market for LDCs' goods, ahead of China (21 %) and the United States (8.2 %): its share of global LDCs' exports of goods increased from 20.5 % in 2012 to nearly 25 % in 2016 ([20]). Secondly, the composition of EU imports from LDCs has significantly changed, shifting progressively from fuel and mining products to manufactured goods. In 2017, EU imports of manufactured goods grew by 6.5 % to EUR 27.1 billion, or 71.8 % of total imports from LDCs, against 42.6 % in 2012. However, these trade figures can be volatile. A sharp fall in commodity prices in 2016 led to an 8.3 % decrease of EU imports from LDCs compared to 2015 ([21]).

'Aid for trade' is a part of ODA that is targeted at trade-related projects and programmes. Aid for trade aims to build trade capacity and infrastructure in developing countries, particularly least developed countries, so that they can benefit more strongly from trade. The EU and its Member States were the leading global providers of aid for trade in 2015, accounting for 49 % of total aid for trade provided by DAC donors. Their aid for trade almost doubled between 2006 and 2015, to reach EUR 2.8 billion in 2015 ([22]).

In spite of the positive developments in trade with developing countries, it needs to be acknowledged that the EU's trade-related indicators — measuring

The EU updated its Aid for Trade Strategy ([23]) in 2017, to reflect the significant changes in the political context both globally — in particular, the 2030 Agenda — and at the EU level, including the new European Consensus on Development ([24]) and Trade for All ([25]). The updated strategy aims to enhance the coherence of aid for trade with other EU policies and instruments including trade policy, notably EU trade agreements and unilateral preference schemes. The focus on LDCs remains a key part of the updated strategy.

the share of imports from developing countries and indicating which products developing countries export to the EU — do not provide insights on whether the products in question are produced in an environmentally and socially sustainable manner. They also do not enable conclusions about the EU's trade balance with developing countries, as exports are not taken into account.

Financial governance within the EU

To help others to advance their economies, it is pivotal to keep the EU's own economies on a sustainable development path. Macroeconomic management that aims to ensure financial stability in the EU is therefore one pillar of the EU's contribution to implementing the SDGs. In addition to financial stability, the EU seeks to transform its economy to become greener, for example through its Europe 2020 strategy for smart, sustainable and inclusive growth. In a global context, where consumption patterns in one region can severely impact production patterns elsewhere in the world, it is particularly important that prices reflect the real costs of consumption and production. They should therefore also include the payments for negative externalities of polluting or other damaging activities to human health and the environment. To facilitate this, the EU calls for a shift from labour taxes to environmental taxes.

The overall trends at the EU level based on the selected indicators look considerably less favourable than for the 'global partnership' above, with falling shares of environmental taxes since the early 2000s.

Financial stability: recovering after the economic crisis

Government debt should be limited to a manageable level and not exceed 60 % of GDP, as laid down in the Treaty on the Functioning of the European Union. However, with the onset of the economic crisis in 2008, debt-to-GDP ratios have risen considerably in many EU Member States. The year 2015 was the first since the economic crisis in which governments' debts fell slightly compared with the previous year, and this decrease continued in 2016 and 2017. At 81.6 % of GDP, the debt-to-GDP ratios of Member States nevertheless remained far above pre-crisis levels, when the ratio was close to the 60 % reference level.

The Treaty on the Functioning of the European Union (TFEU) requires that the ratio of a Member State's planned or actual annual government deficit to gross domestic product at market prices should not exceed 3 % and that cumulated government debt as a ratio of gross domestic product at market prices should be limited to 60 %. The TFEU is complemented by Regulation 1176/2011 on the prevention and correction of macroeconomic imbalances ([26]) as well as Regulation 1174/2011 on enforcement action to correct excessive macroeconomic imbalances in the Euro area ([27]). Both regulations aim to detect fiscal imbalances in the EU and allow, among other things, for sanctions. The Economic Reform Programmes, which were introduced in 2015, form an equivalent system for EU candidates and potential candidates.

In 2017, general government gross debt in the EU as a share of GDP amounted to

81.6 %

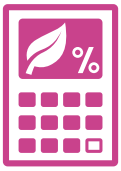
Across the EU, debt-to-GDP ratios ranged from almost 180 % to less than 10 %. A total of 15 Member States reported a debt ratio above 60 % of GDP at the end of 2017. In the period between 2012 and 2017, 16 countries managed to reduce their debt-to-GDP ratios. The more recent decline of debt levels in the EU since 2014 was a result of falling debt-to-GDP ratios in 22 Member States.

'Greening' the taxation system remains a challenge

In a context where trade takes place globally, products produced in one region of the world

are usually consumed elsewhere. Prices should thus also include the payments for negative externalities of polluting or other damaging activities to human health and the environment. However, prices that reflect the real costs of production and consumption are a challenge, in particular when the entire supply chain needs to be considered. EU policies such as Europe 2020 consequently call for a major shift of taxation from labour towards environmental taxes as part of a 'greening' of taxation systems, meaning that revenues from environmental taxes should increase relative to labour taxes. The indicator 'shares of environmental and labour taxes in total tax revenues' presents the shares of these taxes in total revenues from taxes and social contributions.

Overall, the data show there has been no shift of the taxation burden from labour to environment in the EU: in 2016, environmental taxes accounted for only 6.3 % of total tax revenues, while labour taxes accounted for 49.8 % of total tax revenues, an almost eight times higher share. Revenues from environmental and labour taxes as a share of total revenues from taxes and social contributions have both fallen slightly since 2002. In the short-term period since 2011, the decline in the shares of labour tax revenues was slightly stronger than for environmental taxes, indicating a small increase in the relative importance of environmental taxes.



In 2016, the share of environmental taxes in total tax revenues in the EU accounted for

6.3 %

The Europe 2020 strategy ([28]) calls for a major shift from labour to energy and environmental taxes as part of a 'greening' of taxation systems. In the context of the European Semester the progress towards the objectives laid down in the Europe 2020 strategy is monitored.

In 2016, the shares of environmental taxes in total revenues from taxes and social contributions ranged from 4.6 % to 11.7 % across Member States. At the same time, labour taxes accounted for 34.0 % to 58.3 % of total tax revenues in these countries. The ratio of labour to environmental taxes shows how much higher the shares of labour tax revenues were compared to the shares of environmental taxes in a country. In 2016, this ratio ranged from 3.6 to 11.9 across Member States. The countries with rather high ratios such as Germany, Belgium, France and Sweden were all characterised by shares of labour taxes well above 50 % of total tax revenues, while environmental tax revenues only made up about 5 % of total tax revenues in these countries. In contrast, countries with lower ratios of labour to environmental taxes reported shares of labour taxes well below 40 %, while environmental taxes accounted for 8 % or more in total tax revenues. In a majority of Member States, the ratio of labour to environmental taxes has increased since 2004, indicating an increase in the relative importance of labour tax revenues compared to environmental taxes.

Presentation of the main indicators

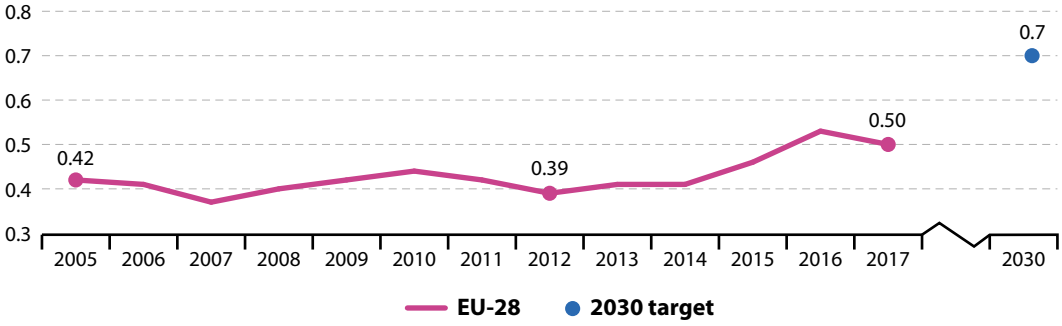
LONG TERM 2005–2017

SHORT TERM 2012–2017

Official development assistance as share of gross national income

Official development assistance (ODA) is provided by governments and their executive agencies to support economic development and welfare in developing countries. ODA must have a minimum grant element of 25 % (at a 10 % discount rate) and be concessional in character. Eligible countries are named in the Organisation for Economic Development and Cooperation's (OECD) Development Assistance Committee (DAC) official list of ODA recipients. ODA disbursements and their purpose are reported by donors to the OECD. Data stem from OECD (DAC).

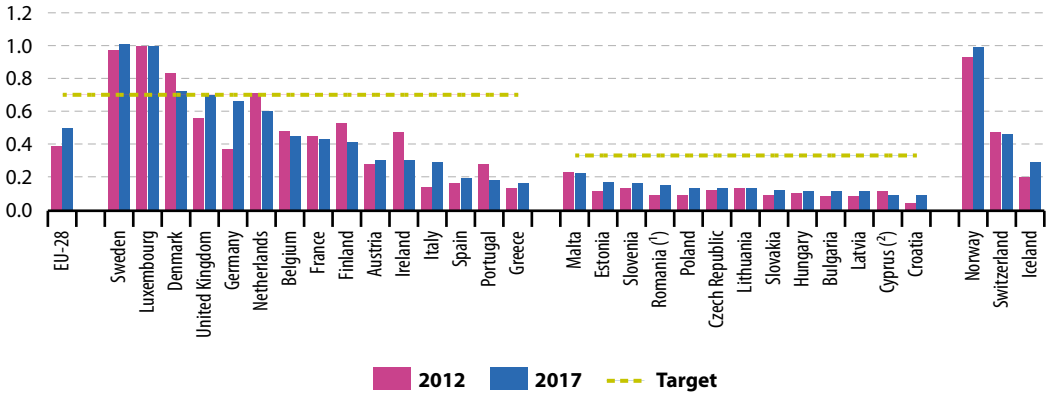
Figure 17.1: Official development assistance as share of gross national income, EU-28, 2005–2017
(% of GNI)



Note: Break in time series in 2016; 2017 data are provisional. Data refer to EU-28 Member States, including EU institutions.
Source: OECD (online data code: sdg_17_10)

Between 2005 and 2017, the EU's ODA to GNI ratio grew by an average of 1.5 % per year. Due to the surge in ODA since 2014, growth was much stronger over the short-term period 2012 to 2017, at 5.1 % per year on average. 2017, however, saw a decrease of EU ODA/GNI ratio to 0.50 %, down from 0.53 % in 2016. With only four EU countries having achieved the 0.7 % target in 2017, additional efforts will be needed from a majority of Member States to meet the renewed collective commitment by 2030.

Figure 17.2: Official development assistance as share of gross national income, by country, 2012 and 2017
(% of GNI)

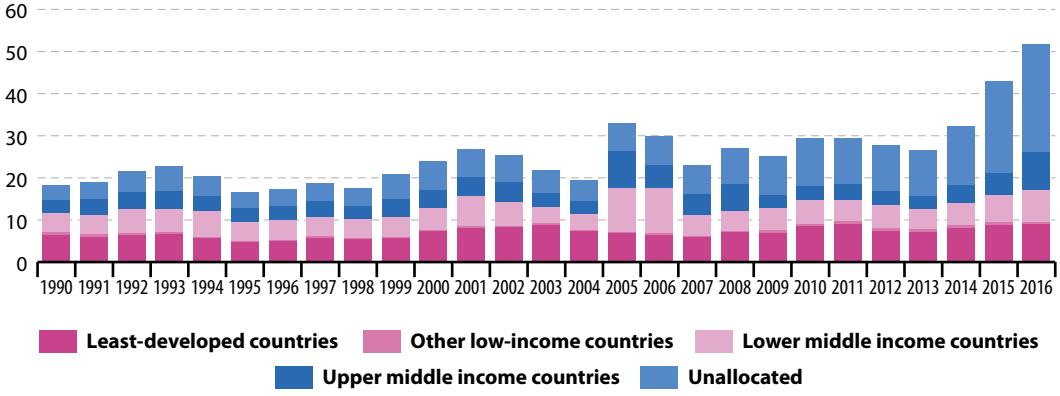


Note: 2017 data are provisional (for all countries).
(1) 2016 data (instead of 2017).
(2) 2015 data (instead of 2017).

Source: OECD (online data code: sdg_17_10)

In 2000, almost one-third (30.3 %) of ODA was allocated to least developed countries (LDCs), 21.3 % to lower middle income countries, 17.3 % to upper middle income countries and 1.8 % to other low-income countries. Another one-third (29.4 %) was unallocated. Since then, ODA to LDCs has increased in absolute terms. However, the proportion of ODA marked as 'unallocated' has increased to 49.7 % in 2016, making it more difficult to identify recipient groups. In 2016, only 17.2 % of ODA was allocated to LDCs, 14.4 % to lower middle-income countries, 17.4 % to upper middle-income countries and 1.3 % to other low-income countries.

Figure 17.3: Official development assistance, by recipient income group, EU-28, 1990–2016
(EUR billion, current prices)

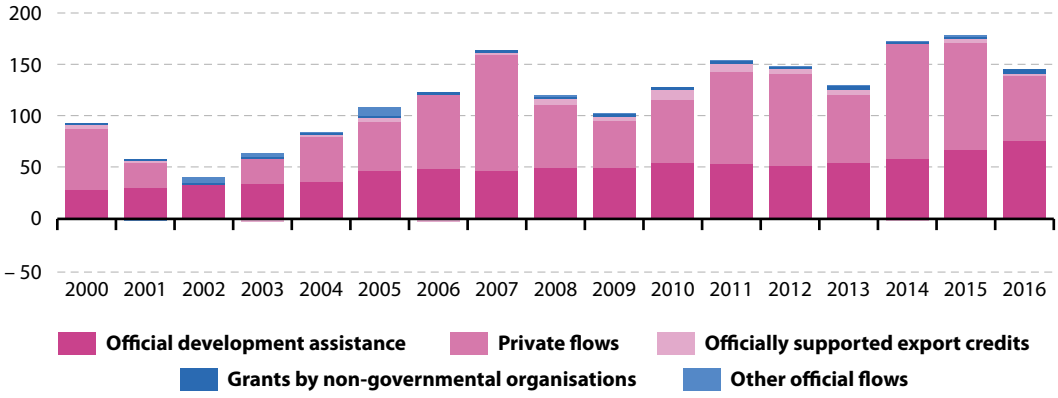


Source: OECD

EU financing to developing countries

EU financing to developing countries takes a number of forms. These include: ODA (public grants or concessional loans with the aim of supporting economic development and welfare); other official flows (OOFs) (public flows that are not focused on development or with a grant element of less than 25 %); private flows (direct investment, bonds, export credits and multilateral flows); grants by non-governmental organisations (from funds raised for development assistance and disaster relief), and officially supported export credits. Data stem from the OECD (DAC).

Figure 17.4: EU financing to developing countries, by financing source, EU-28, 2000–2016
(billion EUR, current prices)



Source: OECD (online data code: sdg_17_20)

The EU trend regarding financing to developing countries has been quite positive in the long term. Between 2001 and 2016, financial flows grew by an average of 6.4 % per year. However, due to fluctuations in private flows, the short-term trend between 2011 and 2016 appears negative, as financial flows declined by 1.2 % annually.

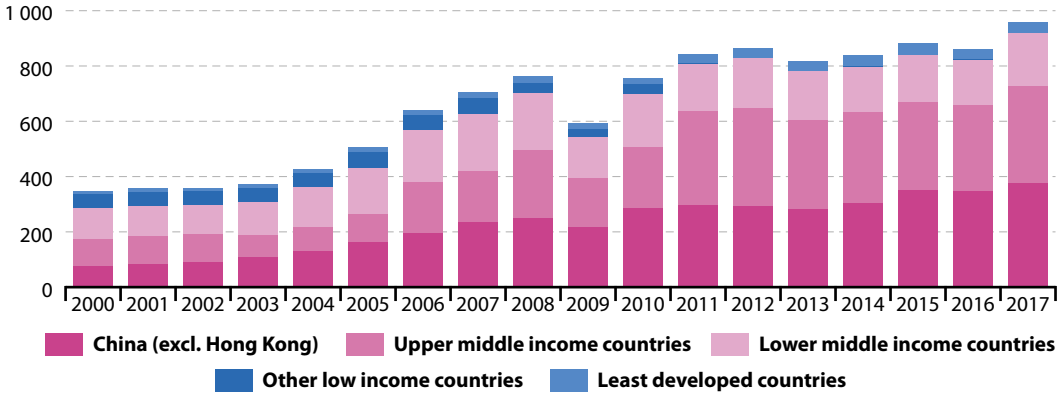
LONG TERM 2002–2017

SHORT TERM 2012–2017

EU imports from developing countries

This indicator is defined as the value (at current prices) of EU imports from the countries on the DAC list of ODA beneficiaries. It indicates to what extent products from these developing countries access the EU market. Information for this indicator is provided by enterprises with a trade volume above a set threshold and is collected on the basis of customs declarations. This information is then adjusted by Member States to account for the impact of trade under this threshold.

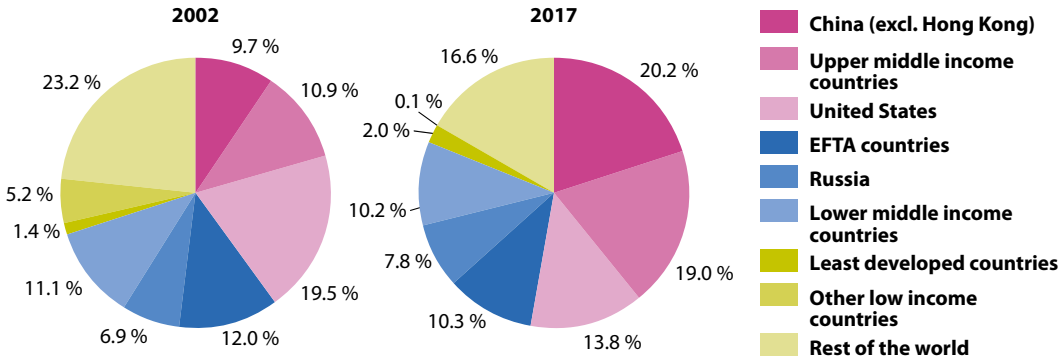
Figure 17.5: EU Imports from developing countries, by country income groups, EU-28, 2000–2017
(billion EUR, current prices)



Source: Eurostat (online data code: sdg_17_30)

Since 2002, EU imports from developing countries more than doubled, from EUR 359 billion to EUR 957 billion in 2017. In the long-term, EU imports from developing countries grew by 6.8 % per year on average. In the short term since 2012, imports still have grown, but less intensely so, with a growth rate of 2.1 % per year.

Figure 17.6: Extra-EU-28 imports, by trading partner, EU-28, 2002 and 2017
(%)



Source: Eurostat (online data code: sdg_17_30 and ext_lt_maineu)

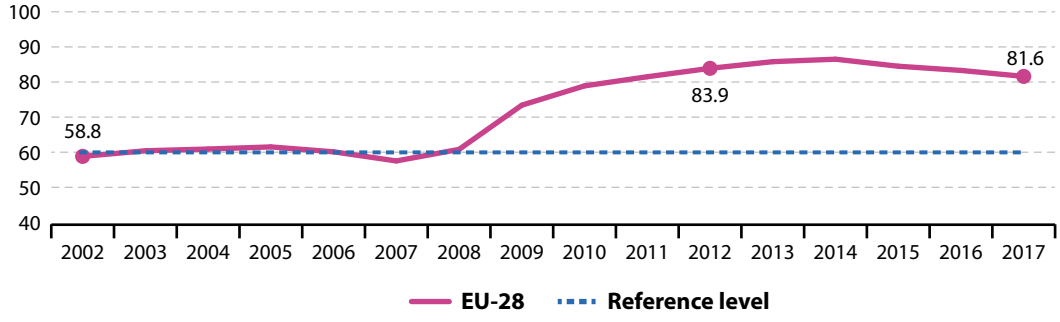
General government gross debt

LONG TERM 2002–2017

SHORT TERM 2012–2017

The Treaty on the Functioning of the European Union defines this indicator as the ratio of government debt outstanding at the end of the year to gross domestic product at current market prices. For this calculation, government debt is defined as the total consolidated gross debt at nominal value in the following categories of government liabilities (as defined in ESA 2010): currency and deposits (AF.2), debt securities (AF.3) and loans (AF.4). The general government sector comprises the subsectors of central government, state government, local government and social security funds.

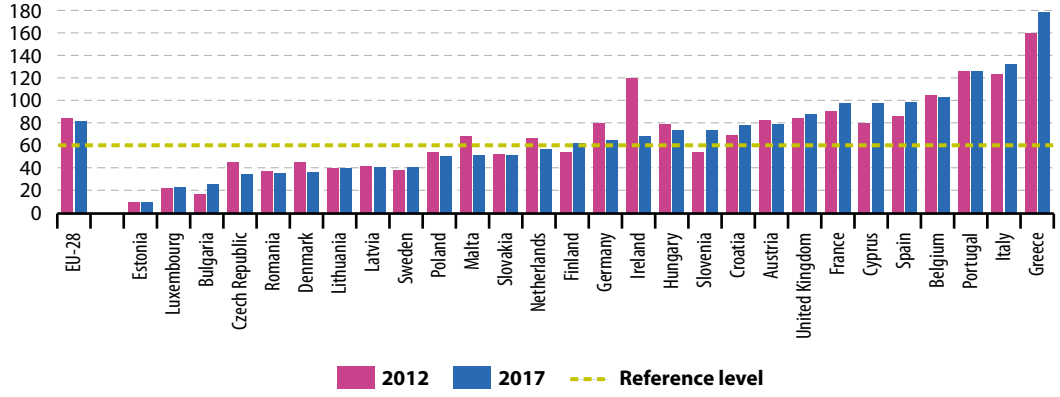
Figure 17.7: General government gross debt, EU-28, 2002–2017
(% of GDP)



Source: Eurostat (online data code: sdg_17_40)

As shown in Figure 17.7, the economic crisis has had a significant impact on debt-to-GDP ratios in the EU. The long-term trend is unfavourable, with the EU's debt-to-GDP ratio growing by 2.2 % annually between 2002 and 2017. Thanks to steady declines since 2014, the short-term trend looks much more positive, with the EU's debt-to-GDP ratio declining by 0.6 % per year between 2012 and 2017.

Figure 17.8: General government gross debt, by country, 2012 and 2017
(% of GDP)



Source: Eurostat (online data code: sdg_17_40)

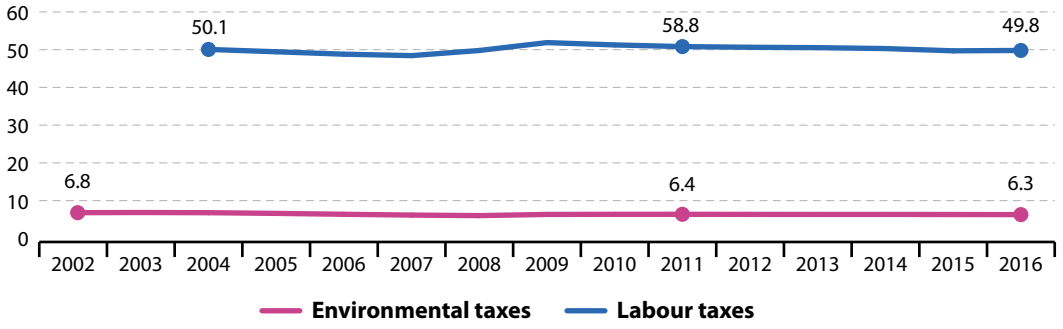
LONG TERM 2002–2016

SHORT TERM 2011–2016

Shares of environmental and labour taxes in total tax revenues

Environmental taxes are defined as taxes whose base is a physical unit (or proxy of it) of something that has a proven, specific negative impact on the environment. Environmental tax revenues stem from four types of taxes: energy taxes (which in the EU contribute around three-quarters of the total), transport taxes (about one fifth of the total) and pollution and resource taxes (about 4 %). Taxes on labour are generally defined as all personal income taxes, payroll taxes and social contributions of employees and employers that are levied on labour income (both employed and non-employed).

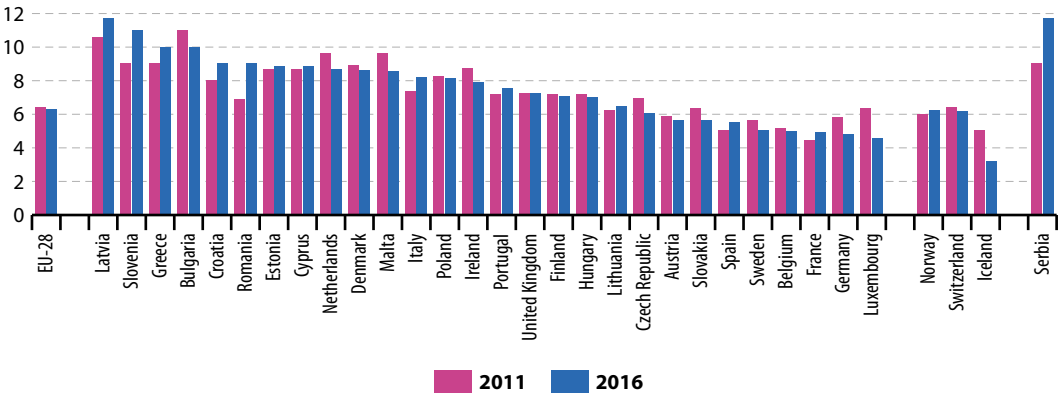
Figure 17.9: Shares of environmental and labour taxes in total tax revenues, EU-28, 2002–2016
(% of total tax revenues)



Source: Eurostat (online data code: sdg_17_50)

The shares of labour and environmental taxes in total EU tax revenues have remained almost unchanged over the past few years, as shown in Figure 17.8. Regarding the long-term trend, the share of environmental taxes in total tax revenues fell by 0.6 % annually, while the short-term decline was slightly slower, at 0.3 % per year. A shift from labour to environmental taxes is thus not visible in the EU.

Figure 17.10: Shares of environmental taxes in total tax revenues, by country, 2011 and 2016
(% of total tax revenues)



Source: Eurostat (online data code: sdg_17_50)

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Notes

(1) European Commission, Multi-stakeholder platform on SDGs.
(2) Non-financial resources include domestic policy frameworks, effective institutions and support for good governance, democracy, rule of law, human rights, transparency and accountability; see also the Addis Ababa Action Agenda (AAAA).
(3) A new statistical measurement is being developed, TOSSD (Total Official Support for Sustainable Development) which aims to support the Addis Ababa Action Agenda by providing a more comprehensive picture of resources for sustainable development, including, among others, mobilised resources from the private sector, emerging donors' flows, and south-south cooperation.
(4) In 1970 the UN General Assembly ratified a Resolution which officially introduced the goal that "Each economically advanced country will progressively increase its official development assistance to the developing countries and will exert its best efforts to reach a minimum net amount of 0.7% of its gross national product at market prices by the middle of the Decade. UN (1970), *International Development Strategy for the Second United Nations Development Decade*, UN General Assembly Resolution 2626 (XXV), 24 October 1970, paragraph 43.
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(16) United Nations (2015), *Addis Ababa Action Agenda of the Third International Conference on Financing for Development, Outcome Document*, endorsed by the General Assembly in its resolution 69/313 of 27 July 2015, §85, p. 40.
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([18]) Council of the European Union (2007), *EU Strategy on Aid for Trade: Enhancing EU support for trade-related needs in developing countries — Conclusions of the Council and of the Representatives of the Governments of the Member States meeting within the Council*, 14470/07, Brussels.
([19]) Source: Eurostat (online data code: ext_lt_maineu).
([20]) European Commission (2017), *Trade in goods with LDC (Least Developed Countries)*, p. 8; and European Commission (2013), *Trade in goods with LDC (Least Developed Countries)*, p. 9.
([21]) European Commission Directorate General Development and Cooperation — EuropeAid (2014), *Cotonou Agreement and multiannual financial framework 2014–20*, Luxembourg, Publications office of the European Union; and European Commission (2017), *Trade in goods with LDC (Least Developed Countries)*, p. 7.
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([27]) European Parliament and Council of the European Union (2011), *Regulation (EU) No 1174/2011 on enforcement measures to correct excessive macroeconomic imbalances in the euro area*.
([28]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.

Annexes

Annex I

Geographical aggregates and countries

EU-28	The 28 Member States of the European Union since 1 July 2013 (BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK)
EU-27	The 27 Member States of the European Union from 1 January 2007 to 30 June 2013 (BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK)
EU-25	The 25 Member States of the European Union from 1 May 2004 to 31 December 2006 (BE, CZ, DK, DE, EE, IE, EL, ES, FR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, SI, SK, FI, SE, UK)
EU-15	The 15 Member States of the European Union from 1 January 1995 to 30 April 2004 (BE, DK, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI, SE, UK)
EEA	The member countries of the European Environment Agency (EEA) are the EU-28 Member States plus IS, LI, NO, CH and TR
G20	Group of 20 (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, the United States and the European Union)

Note that EU aggregates are back-calculated when enough information is available — for example, data relating to the EU-28 aggregate is presented when possible for periods before Croatia joined the EU in 2013, as if it had always been an EU Member State. The abbreviation 'EU' is usually used in texts when referring to the EU-28. The label is changed (to EU-27 or EU-15) if the data refer to another aggregate.

European Union Member States

BE	Belgium
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
DE	Germany
EE	Estonia
IE	Ireland
EL	Greece
ES	Spain
FR	France
HR	Croatia
IT	Italy
CY	Cyprus
LV	Latvia
LT	Lithuania
LU	Luxembourg
HU	Hungary
MT	Malta
NL	Netherlands
AT	Austria
PL	Poland
PT	Portugal
RO	Romania
SI	Slovenia
SK	Slovakia
FI	Finland
SE	Sweden
UK	United Kingdom

European Free Trade Association (EFTA)

IS	Iceland
LI	Liechtenstein
NO	Norway
CH	Switzerland

EU candidate countries

ME	Montenegro
MK	the former Yugoslav Republic of Macedonia
AL	Albania
RS	Serbia
TR	Turkey

Potential candidates

BA	Bosnia and Herzegovina
XK	Kosovo ([1])

Units of measurement

%	per cent
°C	degree celsius
µg	microgram
dB	decibel
EUR	euro
g	gram
ha	hectare
kg	kilogram
kgoe	kilograms of oil equivalent
km	kilometre
km^2	square kilometre
L	litre
m^2	square metre
m^3	cubic metre

([1]) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

mg	milligram
Mt	million tonnes
Mtoe	million tonnes of oil equivalent
pH	pH value (measurement of acidity/basicity)
pkm	passenger-kilometre
pp	percentage point
PPS	purchasing power standard
tkm	tonne-kilometre
USD	US dollar

Abbreviations

AAAA	Addis Ababa Action Agenda
ACP	Africa, the Caribbean and the Pacific
AIDS	Acquired immune deficiency syndrome
AQGs	Air Quality Guidelines
AWU	Agricultural factor income per annual Work Unit
BAP	Benzo(a)pyrene
BMI	Body Mass Index
BMSY	Biomass that enables a fish stock to deliver the Maximum Sustainable Yield
bn	Billion
BOD	Biochemical oxygen demand
BTRIGGER	Value of spawning stock biomass (SSB) that triggers a specific management action
BWD	Bathing Water Directive
CAGR	Compound annual growth rate
CAP	Common Agricultural Policy
CARE	Community database on Accidents on the Roads in Europe
CBD	Convention on Biological Diversity
CEOS	Committee on Earth Observation Satellites
CES	Conference of European Statisticians
CFP	Common Fisheries Policy
CH4	Methane
CMU	Circular material use

CO_2	Carbon dioxide
COD	Chemical oxygen demand
COMEXT	Statistics on international trade in goods
COSME	Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises
CPI	Corruption Perceptions Index
DAC	Development Assistance Committee
DDT	Dichlorodiphenyltrichloroethane
DG	Directorate-General
DIC	Dissolved inorganic carbon
DMC	Domestic material consumption
EAA	Economic Accounts for Agriculture
EAP	Environmental Action Programme
EaSI	Employment and Social Innovation Programme
EBCC	European Bird Census Council
EC	European Commission
ECEC	Early Childhood Education and Care
ECDC	European Centre for Disease Prevention and Control
ECHA	European Chemicals Agency
EEA	European Environment Agency
EFTA	European Free Trade Association
EHIS	European Health Interview Survey
EIB	European Investment Bank
EIGE	European Institute for Gender Equality
EPO	European Patent Office
ERCAS	European Research Centre for Anti-Corruption and State-Building
ESA	European System of Accounting
ESA	European Space Agency
ESAC	European Statistical Advisory Committee
ESAW	European Statistics on Accidents at Work
ESDN	European Sustainable Development Network
ESF	European Social Fund
ESS	European Statistical System

ET 2020	'Education and Training 2020' Framework
ETC/ACM	European Topic Centre on Air pollution and Climate change Mitigation
ETC/BD	European Topic Centre on Biological Diversity
EU	European Union
EU LFS	EU Labour Force Survey
EU SDS	EU Sustainable Development Strategy
EU SILC	EU Statistics on Income and Living Conditions
F	Fishing mortality
FAO	Food and Agriculture Organisation of the United Nations
FDI	Foreign direct investment
FEAD	Fund for European Aid to the most Deprived
FfD	Financing for development
FMSY	Fishing mortality at maximum sustainable yield
FRA	Fundamental Rights Agency
GBOARD	Government Budget Appropriations or Outlays on R&D
GCCA	Global Climate Change Alliance
GDP	Gross domestic product
GERD	Gross domestic expenditure on R&D
GFCF	Gross fixed capital formation
GFCM	General Fisheries Commission for the Mediterranean
GHG	Greenhouse gas
GIC	Gross inland consumption
GNI	Gross national income
GWP	Global warming potential
HCB	Hexachlorbenzol
HELCOM	Baltic Marine Environment Protection Commission — Helsinki Commission
HFC	Hydrofluorocarbons
HIV	Human immunodeficiency virus
HLPF	High-level Political Forum
HLY	Healthy life years
HOT	Hawaiian Ocean Time-series
ICD	International Classification of Diseases

ICES	International Council for the Exploration of the Sea
ICT	Information and Communications Technology
IHD	Ischemic heart diseases
ILO	International Labour Organisation
IPCC	Intergovernmental Panel on Climate Change
ISCED	International Standard Classification for Education
IUU	Illegal, unreported and unregulated
JRC	Joint Research Centre
LDCs	Least-developed countries
Lden	Day-evening-night level
LHPAD	Long-standing health problem or an activity difficulty
LRTAP	Long-range transboundary air pollution
LTAA	Long-term annual average
LUCAS	Land Use/Cover Area frame Survey
LULUCF	Land use, land-use change and forestry
MMR	Monitoring Mechanism Regulation
MPA	Marine Protected Area
MS	Member States
MSFD	Marine Strategy Framework Directive
MSY	Maximum sustainable yield
N	Nitrate/ammonia
N_2O	Nitrous oxide
NACE	Statistical classification of economic activities in the European Community
NEDC	New European Driving Cycle
NEET	Not in education, employment or training
NF_3	Nitrogen triflouride
NGOs	Non-governmental organisations
NH_3	Ammonia
NO3	Nitrate
O2	Oxygen
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development

OLICs	Other low-income countries
OOFs	Other official flows
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
P	Phosphorous
PAH	Polycyclic aromatic hydrocarbon
PCT	Patent Cooperation Treaty
PCB	Polychlorinated biphenyl
PFC	Perfluorocarbons
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
PM	Particulate matter
PO4	Phosphate
POP	Persistent organic pollutant
PPP	Purchasing power parity
PRODCOM	Statistics on the production of manufactured goods
R&D	Research and development
REACH	Registration, Evaluation, Authorisation and restriction of Chemicals
SCI	Sites of Community Importance
SCP	Sustainable consumption and production
SD	Sustainable development
SDGs	Sustainable Development Goals
SDIs	Sustainable Development Indicators
SEAP	Sustainable Energy Action Plan
SECAP	Sustainable Energy and Climate Action Plans
SES	Structure of Earnings Survey
SF_6	Sulphur hexafluoride
SIP	Sustainable Industrial Policy
SPA	Special Protection Area
SSB	Spawning stock biomass
STECF	Scientific, Technical and Economic Committee for Fisheries
SWD	Staff Working Document

TA	Titratable acid
TEN-T	Trans-European Transport Network
TFEU	Treaty on the Functioning of the European Union
TV	Television
UAA	Utilised agricultural area
UIS	UNESCO Institute of Statistics
UN	United Nations
UN FAO	United Nations Food and Agriculture Organization
UN DESA	United Nations Department of Economic and Social Affairs
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNHCR	United Nations High Commissioner for Refugees
UNODC	United Nations Office on Drugs and Crime
UNSC	United Nations Statistical Commission
UOE	UIS, OECD and Eurostat
WCED	World Commission on Environment and Development
WEI	Water Exploitation Index
WHO	World Health Organization
WLTP	Worldwide harmonized Light vehicles Test Procedure
WTO	World Trade Organisation

Annex II

List of indicators included in this report

The tables below show the complete list of indicators included in the respective thematic chapters of the 2018 edition of 'Sustainable development in the European Union — monitoring report on progress towards the SDGs in an EU context'. Indicators used in multiple themes (so-called 'multi-purpose' indicators) are marked with an asterisk (*). Indicators marked with a 'target' symbol ( ) are assessed against a quantified EU policy target. These targets are listed in Table II.18 below.

Table II.1: Indicators for SDG 1 'No poverty', by sub-themes

Indicator
Multidimensional poverty
People at risk of poverty or social exclusion
People at risk of income poverty after social transfers
Severely materially deprived people
People living in households with very low work intensity
In work at-risk-of-poverty rate
Basic needs
Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor
Self-reported unmet need for medical care (*)
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household (*)
Population unable to keep home adequately warm (*)
Overcrowding rate (*)

Table II.2: Indicators for SDG 2 'Zero hunger', by sub-themes

Indicator
Malnutrition
Obesity rate
Sustainable agricultural production
Agricultural factor income per annual work unit (AWU)
Government support to agricultural research and development
Area under organic farming
Gross nitrogen balance on agricultural land
Adverse impacts of agricultural production
Ammonia emissions from agriculture
Nitrate in groundwater (*)
Estimated soil erosion by water (*)
Common farmland bird index (*)
Grassland butterfly index (*)

Table II.3: Indicators for SDG 3 'Good health and well-being', by sub-themes

Indicator
Healthy lives
Life expectancy at birth
Share of people with good or very good perceived health
Health determinants
Smoking prevalence
Obesity rate (*)
Population living in households considering that they suffer from noise (*)
Exposure to air pollution by particulate matter (*)
Causes of death
Death rate due to chronic diseases
Death rate due to tuberculosis, HIV and hepatitis
People killed in accidents at work (*)
People killed in road accidents (*)
Access to healthcare
Self-reported unmet need for medical care

Table II.4: Indicators for SDG 4 'Quality education', by sub-themes

Indicator
Basic education
Early leavers from education and training
Participation in early childhood education
Underachievement in reading, maths and science
Young people neither in employment nor in education and training (*)
Tertiary education
Tertiary educational attainment
Employment rate of recent graduates
Adult education
Adult participation in learning

Table II.5: Indicators for SDG 5 'Gender equality', by sub-themes

Indicator
Gender-based violence
Physical and sexual violence to women experienced within 12 months prior to the interview
Education
Gender gap for early leavers from education and training (*)
Gender gap for tertiary educational attainment (*)
Gender gap for employment rate of recent graduates (*)
Employment
Gender pay gap in unadjusted form
Gender employment gap
Inactive population due to caring responsibilities
Leadership positions
Seats held by women in national parliaments
Positions held by women in senior management

Table II.6: Indicators for SDG 6 'Clean water and sanitation', by sub-themes

Indicator
Sanitation
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household
Population connected to at least secondary wastewater treatment
Water quality
Biochemical oxygen demand in rivers
Nitrate in groundwater
Phosphate in rivers
Freshwater bathing sites with excellent water quality (*)
Water use efficiency
Water exploitation index

Table II.7: Indicators for SDG 7 'Affordable and clean energy', by sub-themes

Indicator	
Energy consumption	
Energy consumption	Primary energy consumption
	Final energy consumption
Final energy consumption in households per capita	
Energy productivity	
Greenhouse gas emissions intensity of energy consumption (*)	
Energy supply	
Share of renewable energy in gross final energy consumption	
Energy dependence	
Access to affordable energy	
Population unable to keep home adequately warm	

Table II.8: Indicators for SDG 8 'Decent work and economic growth', by sub-themes

Indicator
Sustainable economic growth
Real GDP per capita
Investment share of GDP
Resource productivity (*)
Employment
Young people neither in employment nor in education and training
Employment rate
Long-term unemployment rate
Inactive population due to caring responsibilities (*)
Decent work
People killed in accidents at work
In work at-risk-of-poverty rate (*)

Table II.9: Indicators for SDG 9 'Industry, innovation and infrastructure', by sub-themes

Indicator
R&D and innovation
Gross domestic expenditure on R&D
Employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors
R&D personnel
Patent applications to the European Patent Office (EPO)
Sustainable transport
Share of buses and trains in total passenger transport
Share of rail and inland waterways activity in total freight transport
Average CO2 emissions per km from new passenger cars (*)

Table II.10: Indicators for changes in SDG 10 'Reduced inequalities', by sub-themes

Indicator
Inequalities within countries
Inequality of income distribution
Income share of the bottom 40 % of the population
Relative median at-risk-of-poverty gap
People at risk of income poverty after social transfers (*)
Inequalities between countries
Purchasing power adjusted GDP per capita
Adjusted gross disposable income of households per capita
EU financing to developing countries (*)
EU imports from developing countries (*)
Migration and social inclusion
Asylum applications

Table II.11: Indicators for SDG 11 'Sustainable cities and communities', by sub-themes

Indicator
Quality of life in cities and communities
Overcrowding rate
Population living in households considering that they suffer from noise
Exposure to air pollution by particulate matter
Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor (*)
Population reporting occurrence of crime, violence or vandalism in their area (*)
Sustainable transport
Difficulty in accessing public transport
People killed in road accidents
Share of busses and trains in total passenger transport (*)
Adverse environmental impacts
Recycling rate of municipal waste
Population connected to at least secondary wastewater treatment (*)
Artificial land cover per capita (*)

Table II.12: Indicators for SDG 12 'Responsible consumption and production', by sub-themes

Indicator	
Decoupling environmental impacts from economic growth	
Consumption of toxic chemicals	
Resource productivity	
Average CO_2 emissions per km from new passenger cars	
Energy productivity (*)	
Energy consumption	
Energy consumption (*)	Primary energy consumption
	Final energy consumption
Share of renewable energy in gross final energy consumption (*)	
Waste generation and management	
Circular material use rate	
Generation of waste excluding major mineral wastes	
Recycling and landfill rate of waste excluding major mineral waste	

Table II.13: Indicators for SDG 13 'Climate action', by sub-themes

Indicator	
Climate mitigation	
Greenhouse gas emissions	
Greenhouse gas emissions intensity of energy consumption	
Energy consumption (*)	Primary energy consumption
	Final energy consumption
Share of renewable energy in gross final energy consumption (*)	
Average CO_2 emissions per km from new passenger cars (*)	
Climate impacts	
Mean near surface temperature deviation	
Climate-related economic losses	
Mean ocean acidity (*)	
Support to climate action	
Contribution to the international 100bn USD commitment on climate related expending	
Population covered by the Covenant of Mayors for Climate and Energy signatories	

Table II.14: Indicators for SDG 14 'Life below water', by sub-themes

Indicator
Marine conservation
Surface of marine sites designated under Natura 2000
Sustainable fisheries
Estimated trends in fish stock biomass
Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (FMSY)
Ocean health
Seawater bathing sites with excellent water quality
Mean ocean acidity

Table II.15: Indicators for SDG 15 'Life on land', by sub-themes

Indicator
Ecosystem status
Share of forest area
Biochemical oxygen demand in rivers (*)
Nitrate in groundwater (*)
Phosphate in rivers (*)
Land degradation
Artificial land cover per capita
Estimated soil erosion by water
Biodiversity
Surface of terrestrial sites designated under Natura 2000
Common bird index
Grassland butterfly index

Table II.16: Indicators for SDG 16 'Peace, justice and strong institutions', by sub-themes

Indicator
Peace and personal security
Death rate due to homicide
Population reporting occurrence of crime, violence or vandalism in their area
Physical and sexual violence to women experienced within 12 months prior to the interview (*)
Access to justice
General government total expenditure on law courts
Perceived independence of the justice system
Trust in institutions
Corruption Perceptions Index
Population with confidence in EU institutions

Table II.17: Indicators for SDG 17 'Partnership for the goals', by sub-themes

Indicator
Global partnership
Official development assistance as share of gross national income
EU financing to developing countries
EU imports from developing countries
Financial governance within the EU
General government gross debt
Shares of environmental and labour taxes in total tax revenues

List of targets considered for assessing indicator trends

The table below shows which EU policy targets have been considered for assessing indicator trends over the long- and short-term periods, to give an indication whether the development observed over those periods has been on track towards meeting the respective target in the target year. For details on the assessment method for indicators with quantitative targets, see the introduction and Annex III.

Table II.18: EU policy targets considered for assessing indicator trends

Indicator	Target	Policy reference
People at risk of poverty or social exclusion (SDG 1)	Lifting 20 million people out of the risk of poverty or social exclusion by 2020, compared with 2008 (1)	Europe 2020 strategy (2)
People killed in road accidents (SDG 3, SDG 11)	Halving the overall number of road deaths in the European Union by 2020 starting from 2010	Towards a European road safety area: policy orientations on road safety 2011–2020 (3)
Early leavers from education and training (SDG 4)	By 2020, the share of early leavers from education and training should be less than 10 %	Education and training 2020 (4)
Participation in early childhood education (SDG 4)	By 2020, at least 95 % of children between 4 years old and the age for starting compulsory primary education should participate in early childhood education	Education and training 2020
Underachievement in reading, maths and science (SDG 4)	By 2020, the share of low-achieving 15-year-olds in reading, mathematics and science should be less than 15 %	Education and training 2020
Tertiary educational attainment (SDG 4)	By 2020, the share of 30–34-year-olds with tertiary educational attainment should be at least 40 %	Education and training 2020
Employment rate of recent graduates (SDG 4)	The share of employed graduates (20–34 year-olds) having left education and training no more than three years before the reference year should be at least 82 %	Education and training 2020 (5)
Adult participation in learning (SDG 4)	By 2020, an average of at least 15 % of adults should participate in lifelong learning	Education and training 2020
Primary and final energy consumption (SDG 7, SDG 12, SDG 13)	20 % increase in energy efficiency; for the purpose of monitoring this target has been translated into absolute levels of primary and final energy consumption, to be met by 2020	Europe 2020 strategy
Share of renewable energy in gross final energy consumption (SDG 7, SDG 12, SDG 13)	Increase the share of renewable energy sources in final energy consumption to 20 %	Europe 2020 strategy
Employment rate (SDG 8)	The employment rate of the population aged 20–64 should increase to at least 75 %	Europe 2020 strategy
Gross domestic expenditure on R&D (SDG 9)	Increasing combined public and private investment in R&D to 3 % of GDP	Europe 2020 strategy
Average CO2 emissions per km from new passenger cars (SDG 9, SDG 12, SDG 13)	Reduce CO_2 emissions from new passenger cars to 130 grams of CO_2 per km in 2015 and 95 grams of CO_2 per km in 2021	Regulation (EU) No 333/2014 (6)
Greenhouse gas emissions (SDG 13)	Reduce greenhouse gas emissions by 20 % compared to 1990	Europe 2020 strategy
Official development assistance as share of gross national income (SDG 17)	Provide 0.7 % of gross national income (GNI) as ODA within the timeframe of the 2030 Agenda	The new European Consensus on Development (7)

(1) Due to the structure of the survey on which most of the key social data is based (European Union Statistics on Income and Living Conditions), a large part of the main social indicators available in 2010, when the Europe 2020 Strategy was adopted, referred to 2008 data for the EU-27 as the most recent data available. This is why monitoring of progress towards the Europe 2020 poverty target uses EU-27 data from 2008 as a baseline (see European Commission (2013), *Social Europe — Current challenges and the way forward. Annual Report of the Social Protection Committee (2012)*, Luxembourg, Publications Office of the European Union, p. 12).

(2) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.

(3) European Commission (2010), *Towards a European road safety area: policy orientations on road safety 2011–2020*, COM(2010) 389 final, Brussels.

(4) Council of the European Union (2009), *Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020') (2009/C119/02)*.

(5) European Commission (2012), *Education and Training Monitor*, Luxembourg, Publications Office of the European Union.

(6) European Parliament and Council of the European Union (2014), *Regulation (EU) No 333/2014 amending Regulation (EC) No 443/2009 to define the modalities for reaching the 2020 target to reduce CO2 emissions from new passenger cars*.

(7) European Union (2017), *The new European Consensus on Development 'Our World, Our Dignity, Our Future'*, Joint statement by the Council and the representatives of the governments of the Member States meeting within the Council, the European Parliament and the Commission. 2017/C 210/01. Official Journal of the European Union, Volume 60.

Annex III

Method for assessing indicator trends

This section describes the formulas applied for assessing indicator trends in this report. For an overview of the assessment approach and a description of the data basis and the time periods for which the assessment is done, please see the Introduction chapter.

Method 1: Indicators without quantitative targets

The assessment of trends for indicators without quantitative targets, both for the long-term (past 15 years) and short-term (past 5 years) periods, is based on the compound annual growth rate (CAGR), using the following formula:

$$(1)\quad CAGR = \left(\frac{y_t}{y_{t_0}} \right)^{\frac{1}{t-t_0}} - 1$$

where: t_0 = base year, t = most recent year, yt_0 = indicator value in base year, y_t = indicator value in most recent year

The table below shows the applied thresholds and the resulting symbols.

Table III.1: Thresholds for assessing trends of indicators without quantitative targets

Growth rate (CAGR) in relation to desired direction	Symbol
≥ 1 %	↑
< 1 % and ≥ 0 %	↗
< 0 % and ≥ - 1 %	↘
< - 1 %	↓

Method 2: Indicators with quantitative targets

The assessment of trends for indicators with targets is based on the CAGR described above and also takes into account concrete targets set in relevant EU policies and strategies. For this type of indicator, the actual (observed) growth rate is compared with the (theoretical) growth rate that would have been required up to the most recent year for which data are available in order to meet the target in the target year. This comparison is done for both the long-term (past 15 years) and short-term (past 5 years) periods and does not take into account projections of possible future developments of an indicator. The calculation of actual and required indicator trends is based on the CAGR formula and includes the following three steps:

Actual (observed) growth rate:

$$(2a)\quad CAGR_a = \left(\frac{y_t}{y_{t_0}}\right)^{\frac{1}{t-t_0}} - 1$$

where: t_0 = base year, t = most recent year, yt_0 = indicator value in base year, y_t = indicator value in most recent year

Required (theoretical) growth rate to meet the target:

$$(2b)\quad CAGR_r = \left(\frac{x_{t_1}}{y_{t_0}}\right)^{\frac{1}{t_1-t_0}} - 1$$

where: t_0 = base year, t_1 = target year, y_{t0} = indicator value in base year, x_{t1} = target value in target year

Ratio of actual and required growth rate:

$$(2c)\quad R_{a/r} = \frac{CAGR_a}{CAGR_r}$$

The table below shows the thresholds applied for the $R_{a/r}$ ratio and the resulting symbols.

Table III.2: Thresholds for assessing trends of indicators with quantitative targets

Ratio of actual and required growth rate	Symbol
≥ 95 %	↑
< 95 % and ≥ 60 %	↗
< 60 % and ≥ 0 %	↘
< 0 %	↓

Method for calculating average scores at the goal level

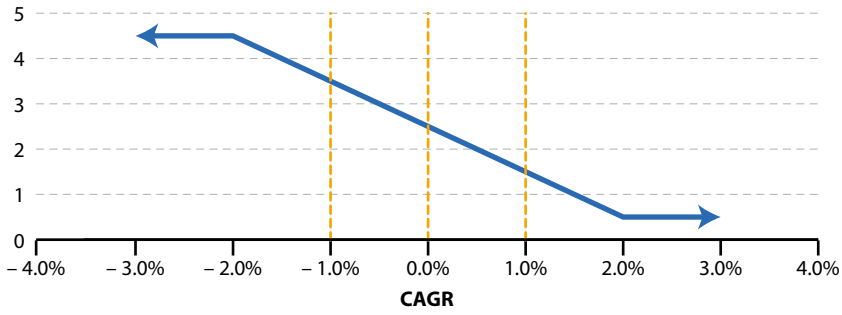
The calculation of average scores on the level of the individual SDGs is based on the calculations described above for the indicators that have been chosen to monitor the respective SDG. For indicators without quantitative targets, the CAGR (see formula (1) above) is used. For indicators with quantitative targets, the ratio of actual to required growth (see formula (2c) above) is used. These values are inserted into a scoring function (which is different for indicators with and without quantitative target) in order to calculate a score ranging from 0.5 (best score) to 4.5 (worst score) for each indicator. In this 2018 edition of the EU SDG monitoring report, these indicator scores are only calculated for the short-term (past 5 years) period. The average scores on the goal level are then calculated as the arithmetic mean of the individual scores of the indicators chosen for monitoring the respective goal (including both main and multipurpose indicators). Consequently, these goal-level scores can also range from 0.5 (best score) to 4.5 (worst score).

Note that the scoring functions use broader cut-off points than the thresholds shown in Tables III.1 and III.2 in order to allow for larger variability in the scores (an indicator with a CAGR of, for example, 1.1 % per year receives a different score than an indicator with a CAGR of, for example, 5.0 % per year, although they both fall into the same assessment category of Table III.1). However, the scores at the threshold points in Tables III.1 and III.2 are harmonised (the threshold values shown in both Tables result in scores of 1.5, 2.5 and 3.5, respectively) to ensure that indicators with and without quantitative targets have the same 'weight' when calculating the average score at the goal level.

Scoring function for indicators without quantitative targets

Figure III.1 below shows the scoring function for indicators without quantitative targets. In this case, the scoring function is a linear transformation, with cut-off points set at growth rates (CAGR) of 2.0 % and – 2.0 %. Indicators with a growth rate of exactly 0.0 % receive a score of 2.5. Indicators with growth rates of 2.0 % or above in the desired direction receive a score of 0.5, indicators with growth rates of 2.0 % or above in the wrong direction receive a score of 4.5.

Figure III.1: Scoring function for indicators without quantitative target

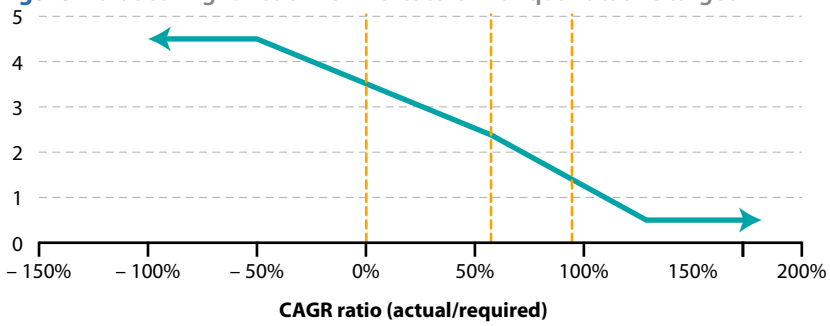


Note: The orange dotted lines represent the thresholds used for defining the assessment category of the indicator, as shown in Table III.1 above.

Scoring function for indicators with quantitative targets

Figure III.2 below shows the scoring function for indicators with quantitative targets. The scoring function is not linear in this case, with cut-off points set at CAGR ratios (actual to required growth) of 130 % and – 60 % (ratios below zero indicate a movement away from the target). Indicators with a CAGR ratio of 60 % receive a score of 2.5. Indicators with CAGR ratios of 130 % or above receive a score of 0.5, indicators with CAGR ratios of – 60 % or below receive a score of 4.5.

Figure III.2: Scoring function for indicators with quantitative target



Note: The orange dotted lines represent the thresholds used for defining the assessment category of the indicator, as shown in Table III.2 above.

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PDF: KS-01-18-656-EN-N
Print: KS-01-18-656-EN-C

Sustainable development in the European Union

MONITORING REPORT ON PROGRESS TOWARDS THE SDGS IN AN EU CONTEXT

Sustainable development is firmly anchored in the European Treaties and has been at the heart of European policy for a long time. The 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), adopted by the UN General Assembly in September 2015, gives a new impetus to global efforts for achieving sustainable development. The EU is fully committed to playing an active role to maximise progress towards the Sustainable Development Goals.

This publication, titled 'Sustainable development in the European Union — Monitoring report on progress towards the SDGs in an EU context (2018 edition)', is the second in the series of Eurostat's reports monitoring progress towards the SDGs in an EU context. The analysis in this publication builds on the EU SDG indicator set, developed in cooperation with a large number of stakeholders. The indicator set comprises 100 indicators and is structured along the 17 SDGs. For each SDG, it focuses on aspects which are relevant from an EU perspective.

The monitoring report provides a statistical presentation of trends relating to the SDGs in the EU over the past five years ('short term') and, when sufficient data are available, over the past 15 years ('long term'). Indicator trends are assessed on the basis of a set of specific quantitative rules, visualised by arrow symbols. The publication also presents the aggregated EU progress towards each SDG.

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Publications Office

PDF: ISBN 978-92-79-88744-4 doi:10.2785/401485
Print: ISBN 978-92-79-88745-1 doi:10.2785/221211