



Steering towards

a better tomorrow...













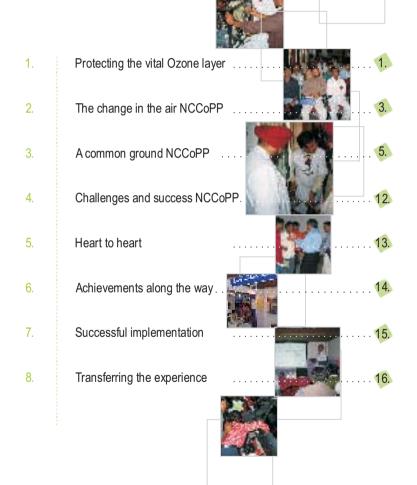








Nationwide Project Resources





Transferring the experience

NCCoPP is a proven unique model demonstrating that technology transfer in the huge and widespread informal sector can be achieved at reasonable cost. Changing over from environmentally unsafe to appropriated technologies helps both the environment as well as the sustenance of technicians. Achieving this objective was possible through a well knit system and the development of innovative processes for implementation.

The infrastructure, the resources, the management and the methodology adopted for the implementation of NCCoPP will benefit other projects where the technology may be different but the ultimate purpose is to facilitate technology transfer and upgradation of skills.

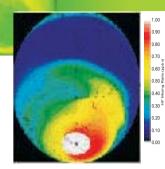
This positive experience may also be relevant for developing future HCFC phase-out strategies, which have yet to be formulated by Article 5 countries under the Montreal Protocol as well as in the context of other international environmental agreements.

In retrospect

NCCoPP as blue print for replication of technology transfer in informal sector



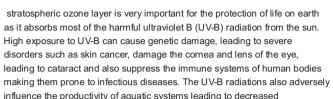




The Ozone Layer

Ozone is a reactive gas consisting of three oxygen atoms, formed naturally in the atmosphere by the association of molecular oxygen (O2) and atomic oxygen (O).

At lower levels ozone gas is a pollutant which can cause severe problems like oedema, haemorrhage, etc., while the



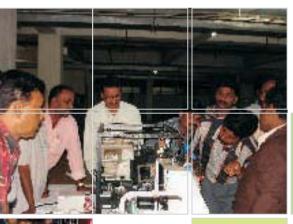
Protecting the vital Ozone layer Success story of the Montreal Protocol

leading to cataract and also suppress the immune systems of human bodies making them prone to infectious diseases. The UV-B radiations also adversely influence the productivity of aquatic systems leading to decreased reproductive capacity and impaired development. Furthermore UV-B radiations hinder the growth, photosynthesis, and flowering of major agricultural crops like rice, wheat, corn and soy bean. Thus destruction of the ozone layer would pose a major threat to all life on earth.

The depleting Ozone layer and the Ozone hole

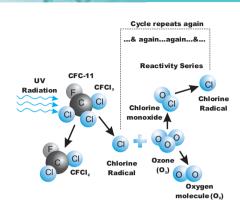
In recent years, data collected of the upper atmosphere has shown a general thinning of the ozone layer over most of the globe. More dramatic damage

occurs over Antarctica each spring when the ozone hole forms. This depletion in the ozone layer is far beyond seasonal variations, and the natural balance is not being restored. Research has revealed that man-made chemicals released into the air are contributing to the depletion of the ozone layer.





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Ozone Depleting Substances (ODS)

Research has revealed that there are several chemicals such as chlorofluorocarbons, halons and methyl bromide that contribute to ozone depletion. In the early 1930s when CFCs were first discovered, their non-toxic, non-flammable, and non-reactive properties made them ideal for many industrial and domestic applications like coolants for commercial and home refrigeration units, aerosol propellants, electronic cleaning solvents, and blowing agents.

Chlorofluorocarbons were in great demand and produced in abundant quantities. It was only in 1973 that the scientists discovered that the chlorine found in CFCs causes ozone destruction. When CFC molecules drift into the atmosphere. the UV-B and UV-C radiation from the sun releases their chlorine atoms. Complex chemical reactions in the atmosphere result in the formation of chlorine monoxide, which reacts with the ozone molecule to form oxygen and regenerates more chlorine atoms that carry on converting the ozone molecules. Each chlorine atom can destroy as many as 100,000 ozone molecules over 100 vears. Thus, even a small quantity of CFCs released in the atmosphere can cause tremendous damage to the ozone layer.

The Montreal Protocol

Faced with the reality that CFCs and other chlorinated substances could cause serious ozone depletion, in 1987, policy makers from around the world signed an international treaty, the "Montreal Protocol on Substances that Deplete the Ozone Layer". According to this multilateral environmental agreement the signatory countries will phase out CFCs and other ODS as per a given schedule, with a complete halt by 2010. Till date 191

countries are signatories to the Montreal Protocol.

Under the Protocol, industrialized nations ("Article 2 countries") have rapidly eliminated most ozone depleting substances. Developing countries ("Article 5 countries") are following suit, with critical assistance from the Protocol's Multilateral Fund, which has already committed over US \$ 2.5 billion to assist themin the transition to ozone-friendly substances without hampering their economic growth.

India became a party to the Vienna Convention on 19 June 1991 and acceded to the Montreal Protocol on Substances that Deplete the Ozone Layer on 17 September 1992.

In retrospect Importance of Ozone

Positive effects of the Montreal Protocol towards Ozone re-build up.



Successful implementation

Training

Training component was brought in to ensure sustainability of business for the technicians with the change in technology. Hence the technicians are not out of business and adding to unemployment figure of the country. Over 16000 technicians trained and these are trained from nook and corners of the country. Initially the objective was to train only the technicians repairing the refrigerators and airconditioners. While reviewing it was seen that the Mobile Air Conditioning (MAC) and Systems with Open type compressors (OTC) too consumed high level of CFC. Hence training for the MAC and OTC technicians was designed and the trainers were trained; training material was developed for the trainers as well as the technicians the methodology adopted for developing the program for the RAC technicians was adopted for MAC and OTC as well. As the model was a success. The training material developed was in several vernacular languages and successfully implemented.

Equipment Support

In order to ensure what was taught in the training is implemented good service practices and increasing the turnover of the technicians right set of equipment were required. The equipment was introduced by the NCCoPP. They were not fully subsidized the RSE had to partially contribute to avail the scheme as well all coming forward were not receiving the equipment instead only those who were genuine could avail the benefit. The equipment was promoted to technicians through mailers and awareness workshops conducted in the country. An overwhelming response was seen at the workshops resulting in receiving several expression of interest - forms.

Awareness

Print as well as visual media were the tools for awareness. A periodic newsletter was published reaching the technicians as well as dealers, RAC associations, bilateral and multilateral donor agencies. Posters that provided information necessary for the technicians were printed and distributed. Video film about the project helped recruitment of technicians to the training programs as well disseminated information about CFC and why phase out CFC. Workshops provided a platform to directly interact with the target group hence enlightening them about their contribution to the objective of the project as well as survival of their business.

Customs and Policy Training

A step to avoid travel of refrigerants in the country without the required procedures training the customs officer was a step ahead and not only training but providing refrigerant identifiers to the officer. The officers were trained to know more about the refrigerant as well as to help detect the refrigerant. Several officers have been trained.

In retrospect

Components of successful implementation

Training

Equipment support

Awareness

Customs and policy training

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Achievements along the way

To date, most large manufacturers of domestic appliances in India have opted for HC foam technology which was introduced under ECOFRIG and one of India's major refrigerator manufacturers converted the entire refrigerator manufacturing line to HC blend technology during this project (supported by MLF Funds through the World Bank). The training infrastructure created by HIDECOR has been completely integrated into the NCCoPP strategy focusing on the important role of CFC and non-CFC based good servicing practices. While HIDECOR was geographically restricted to selected states in South India, the NCCoPP is now providing similar services for the entire country and all remaining RSEs.

irrespective of size, turnover or linkage to industries. The NCCoPP will support India in achieving a complete phase-out of CFC consumption in the RAC sector.

Though more has to be done before ozone depleting substances are eliminated before 2010, the future looks positive. NCCoPP will go about doing its good job further and lead to more achievements, milestones and happiness.

In retrospect

Sustainability current status of the project

ndustries. The The National CFC Consumption complete phase-out Phase-out Plan (NCCoPP) is

Phase-out Plan (NCCoPP) is India's final CFC phase-out project for the refrigeration and air conditioning (RAC) servicing sector. CFCs are banned from use in manufacturing of refrigeration appliances such as refrigerators or car air conditioners under the Ozone Rules 2000 since January 2003. The project aims to support India in completely phasing out the CFC consumption from the refrigeration servicing sector by 1st January 2010 to secure India's compliance with the phase out schedules of the Montreal Protocol. NCCoPP is funded by the Multilateral Fund of the Montreal Protocol. In parallel the production of CFCs in India (and else where in the World) are being phased out. Compared to the 1999 baseline. the production sector sales had been reduced to 50% by 2005. These have been further reduced to 15% of the 1999 volumes by 1st January, 2007.

The change in the air NCCoPP

NCCoPP took over from the Indo-Swiss Human and Institutional Development in Ecological Refrigeration (HIDECOR) project. The HIDECOR operation, initiated in 1998, was geographically restricted to selected states and the target group was Micro, Small and Mediumsized service enterprises in the RAC sector. Currently NCCoPP has a presence in all the States of India.

The country is a major producer and consumer of Chlorofluorocarbons (CFCs) and the refrigeration and air conditioning (RAC) sector is the largest consumer of CFCs in the country. About two-third of this consumption is being used in the servicing of RAC equipment/appliances.

The NCCoPP, approved in 2004 by the Executive Committee of the Multilateral Fund (MLF), and the complementary predecessor projects, ECOFRIG and HIDECOR, are three consecutive and inter-dependent projects in the Indian RAC sector which have demonstrated how the goals of bilateral development assistance combined with multilateral contributions under the Montreal Protocol can effectively strengthen multilateral processes and assist a major Article 5 country in complying with its obligations.







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ECOFRIG began within the framework of Indo-German-Swiss cooperation in 1992. The objective of the project was to establish a level playing field for environment-friendly natural refrigerants in the RAC sector. Natural refrigerants like hydrocarbons (HC) do not deplete the ozone layer and have a very low global warming potential compared to hydrofluorocarbons (HFCs) and hydrochlorofluorocarbons (HCFCs).

In the late 1990s, it became clear that refrigeration servicing enterprises (RSEs) generally would not be able to adapt on their own and in time to the new and more demanding non-CFC technologies selected by the dominant market players. At stake was nothing less than the survival and employment of many small and informal enterprises in an important industrial sub-sector. Without well-functioning RSEs, the servicing of old and new equipment would be compromised. Enhancing the skills of more than 39,000 RSEs with over 77,000 technicians was therefore recognized as an important aspect to support the Government of India's goals to achieve national CFC phase-out targets.

At that time, the Swiss Agency for Development and Cooperation (SDC) focused on RSEs from a development policy and environmental protection perspective. As a result of this, the HIDECOR project was developed by SDC, first in a pilot phase under the umbrella of ECOFRIG, and later as a separate project under Indo-Swiss bilateral cooperation. The methodologies and infrastructure created under HIDECOR also formed the basis to formulate a national strategy for the phase-out of CFCs focusing on refrigeration servicing enterprises. This national strategy was then approved as the NCCoPP at the 42nd Meeting of the Executive Committee (ExCom) of the MLF.

This positive experience may also be relevant for developing future HCFC phase-out policies, which have yet to be formulated by Article 5 countries under the Montreal Protocol.

In retrospect

Phasing out of CFC consumption by 1 st January
2010 by India

Demonstration that bilateral cooperation is capable to assist partner countries with the task of integrating multilateral environmental agreements through supporting specific technology options that are beneficial for the ozone layer, climate change and the environment generally

This positive experience may also be relevant for developing future eco-unfriendly refrigerant / gas phase-out policies, which have yet to be formulated









Heart to heart

Interviews of participants

Interview 1

Why are you attending the RSE technicians training workshop?

To be up-to-date in RAC sector, good servicing practices, and gain more knowledge about CFC phase out and the consequences if CFC is not phased out.

What all have learnt here?

Lots mainly, those that will help technician like me to be prepared for the future and move to newer technologies and offer the best of my services to my customers.

How are you finding it at the training programme?

I am finding the training program very informative. The instructors, other technicians are all friendly and cooperative. We are all here to learn and help save the earth.

Would you attend a similar workshop in the future?

Certainly given the time and opportunity, I would love to be attending similar workshops in the future.

Would you recommend these training programs to your technician friends?

Yes. I would like them to gain and profit from this experience and help save the earth in the process.





Interview 2

Where are you from?

I am from a village in Uttar Pradesh (UP)

Who informed you about this workshop?

I heard it from my friends and the dealer from where I purchase spares for the servicing of equipment.

What all has been taught here?

Oh, a lot many things. These that will help me face the future challenges in the RAC servicing sector and upgrade to newer technologies and satisfy my customers.

What is your experience here?

Good. Everyone is quite helpful. We are all here to learn.

Would you attend a similar workshop in the future?

Certainly. I would love to be attending similar workshops tomorrow

Would you mention this to your technician friends?

Yes. I would like them to grow from this experience and help save the earth in the process.

In retrospect

Interviews of participants

Positive attitude and reception

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Challenges and success - NCCoPP

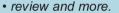
The challenges and success: NCCoPP has achieved over and above the set targets under all the components of the project. Some of the reasons why the success could be achieved were:

- Thoughtful planning for implementation of the project, the planning was with the basic premise of intelligently using limited funds to reach out to most of the technicians. The objective of the project was to 'Phase out CFC in the Refrigeration Servicing Sector' by reaching the technicians who are widespread throughout the country. The best way out was to have a multiplier effect for all the components being implemented under the project viz training, equipment support scheme and awareness.
- Team of dedicated implementing agencies with a strong agenda to support implementation of the project
- Highly dedicated bilateral agency leading the project with the required leadership

- Accurate and relevant data base for evidence based decision making
- Optimal utilization of the resources available both in the field as well as at the office of the lead implementing agency
- Regular review of the systems developed analysis of incorporated and in tune improvements.
- Highly effective and developed network.

In retrospect

- Challenges of NCCoPP achievement
 - planning Implementing
- decision making maximum utilisation
 review and mare.



A common ground NCCoPP

Support and implementation

The project is financed by the Multilateral Fund (MLF) and is being implemented by five implementing agencies under overall responsibility of the Ozone Cell of the Ministry of Environment & Forests (MoEF), Government of India. The lead implementing agency is GTZ-Proklima, as mandated by Government of Germany, also hosting the project management unit. Training activities are managed by INFRAS Zurich under mandates from the Government of Switzerland and GTZ Proklima. Investment-related activities, such as the

Equipment Support Schemes (ESS) for servicing firms, are implemented by the United Nations Development Programme (UNDP) and GTZ-Proklima. UNDP is also implementing two sector phase-out plans in the foam and refrigeration

(manufacturing) sectors. Within the refrigeration (Manufacturing) sector phaseout the United Nations Industrial Development Programme (UNIDO) takes care of the transport refrigeration (manufacturing)-related phase-out activities. The United Nations Environment Programme (UNEP) is responsible for awareness as well as customs and policy training support.

The project's main focus is to promote and support the country to phase out CFC from the servicing sector. The project adopts a multi-pronged approach to achieve its objective through five components of the project. They train technicians predominantly from micro and small scale refrigeration servicing sector enterprises in good servicing practices, alternative non-CFC refrigerants (HFC134a and hydrocarbons) and retrofit. Since 2001, more than 16,000 technicians have been trained under NCCoPP and its predecessor project HIDECOR. With the completion of the project capacity building of about 20000 25000 technicians would have been trained. Additionally, dedicated training programmes disseminate knowledge of good servicing practices and retrofit of Mobile Air-Conditioning (MAC) and Open Type Compressors (OTC). OTCs are used in Railways and small scale food processing enterprises where CFC consumptions are very high.

Training partners

Training is offered through a network of training cells in the 15 States in India. The training cells are managed by Regional Management Organisations (RMOs) which coordinate the training programmes. Appliance Industries also

provide their resources to train refrigeration servicing enterprise technicians in addition to their own employees and franchisees.

RSE technicians are spread throughout India in cities and small towns where they practice their trade. So the training programmes for technicians are conducted not only in the state capitals or big cities of the country but also the small towns where there are more number of technicians.







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Successful implementation

Implementation of the programme follows a seven stage plan towards phase out:

- Developing partnerships with training partners, industry associations and institutions in the RAC sector
- Identifying locations for training to ensure coverage to many RSE technicians
- Understanding requirements through extensive field work and close interaction with the project partners, industries, RSEs, Research Institutes, and others
- Identifying additional areas where CFC consumption is high through industry experiences, surveys and research
- Providing technical assistance through consultative workshops, extending to needspecific training
- Assessing needs to enhance quality of work and higher returns to the technicians with potential alternatives such as Equipment Support and more...
- Enabling access to information through circulation of print publications and project website

Industry partners such as Godrej & Boyce Mfg.

Ltd., Whirlpool, and Kirloskar Copeland Ltd. participate in the programme and provide their resources to train refrigeration servicing enterprise technicians in addition to training their own service networks and franchisees







All selected training institutions are given initial support

through training of trainers' workshops and equipment to

reinforce their capacity and infrastructure for Refrigeration

Service Enterprise (RSE) Technicians Training. This has been

How to handle new technology for better servicing practices

· Proper servicing and retrofitting of refrigeration appliances

The trainers identified to train the technicians are trained in a

Trainers (ToT) programme designed for the trainers to impart

training to the RSE technicians. The ToT includes theory as

well as practical training. Thereafter the trainers can conduct

programme 'Training of Trainers'. A five day Training of

· How to recover and re-use CFC and HFC refrigerants

designed as effective, practical 2-day sessions. It illustrates:

· Good servicing practices in handling CFC

using alternative HFC and HC refrigerants

Training of Trainers

the training programmes.













Customs and Policy Support

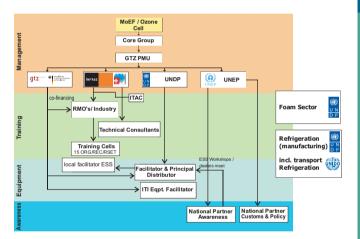
The objective of the training is to teach customs and enforcement officers about the harmful effects of Ozone Depleting Substances (ODS), the Montreal Protocol which determines internationally the use and trading of ODS, the trends and types of illegal trading of such substances and the actions to be taken. It also looks at the role of customs officers and other government agencies in regulating ODS flow within the states and across the borders.

There are three main activities undertaken for this customs and policy training with assigned implementing agencies, defined target groups and objectives. In this activity, the implementing agencies are UNEP and NACEN with the target audiences such as customs and enforcement officers (target A) and (target B) officers.

Firstly, on line training development, to initiate a wider implementation and to optimize training.

Secondly, organization and follow up training workshops the target audiences are customs officer and other policy stakeholders and officers other than in customs/enforcement, to ensure effective implementation of policies and regulations and to optimize number of trainees who receive quality training within available funding.

And lastly, developing and distributing the refrigerant identifiers.



In retrospect

Support and cooperation by multilateral bodies

Many affected enterprises

Training through partners

Successful implementation



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The dealer workshops are good points of contact. enabling project partners to exchange ideas about recruiting plans with the dealers and to enlist the support of the dealers throughout the States in encouraging technicians to come forward for training. The programme offered at the meeting with dealers covers presentations on the impact of CFC on the environment, the important differences with the alternative refrigerants, the present status of phase-out in India and what NCCoPP offers. The format of training programmes offered to technicians is outlined as well as other important aspects of the programme. The dealers meetings are scheduled according to training programme development.

Equipment Support Scheme

Technicians require appropriate equipment to retrofit CFC12-based appliances with non-CFC refrigerants and efficiently service both CFC and non-CFC appliances. Through NCCoPP. Refrigeration Service Enterprises can purchase different subsidized packages in accordance with their needs. Eligibility criteria are defined and a process is defined to shortlist the eligible RSEs.

A guideline has been prepared for the numbers of equipment to be distributed in each of the states defined on the basis of CFC consumption in each state. Specific ESS Workshops disseminate information regarding the scheme and the various equipment packages available to the technicians and the servicing centres as well as general information on the phaseout of ODS.

The distribution of equipment is being done in phases in the country. During the the first phase distribution commenced in the states of Andhra Pradesh, Karnataka and Tamil Nadu. including Pondicherry. In the second phase, distribution of equipment began in the states of Kerala, Gujarat and Maharashtra. The third phase covered Rajasthan, Uttar Pradesh, Delhi, Chandigarh, Uttaranchal, Haryana, Punjab, Himachal Pradesh and Jammu & Kashmir. The fourth phase embraced Assam and the seven north eastern states. West Bengal, Orissa, Bihar, Jharkhand, Chattisgarh and Madhya Pradesh.

The Fifth phase will be open to all the states where there is still facilitate the tasks of distribution at the local level.

A refresher workshop for trained trainers

The key objective of the workshop is to enhance the understanding of the trained trainers on the topics covered in the RSE training as well as to provide knowledge about good service practices and retrofitting of Mobile Air Conditioning (MAC) and Open Type Compressors (OTC) (Ice-candy plants).

Training Handouts

Technicians may find it useful to look at the training handout which has been prepared by RAC experts and is used in the training programmes. The manuals should. of course, in no way replace the technicians' participation at training programmes. Learning by doing is essential in order to fully integrate new knowledge. Technicians have a better understanding of equipment, if this is handled and used during the practical session. The equipment is promoted in order to improve the servicing practices of the technicians. So come and register for training and you will receive a copy of this handout at the training programme.

Industrial Training Institutions - ITIs

The syllabus for the trade of Refrigeration and Air Conditioning Mechanic under Craftsman Training Scheme was revised under the HIDECOR project. To implement the revised syllabus, the training institutes would require equipment, tools and appliances. NCCoPP project decided to provide equipment support to few of Government ITIs. Thus the selected Government ITIs would receive equipment under ESS. RAC instructors from these selected ITIs have attended instructor training programmes at either ATI Howrah or ATI Hyderabad. The updated curriculum for the Refrigeration and Air Conditioning trade was put into effect from June 2003

Railways

Indian Railways is making proactive efforts to employ good servicing practices and phase-out CFCs.



Awareness

For NCCoPP to become a success, everyone from the common man to the technician to the industry has to be committed to CFC phase-out. Information dissemination and creating awareness is, therefore, a critical factor. Various media, both print and audio-visual, are being employed to create awareness. Posters promoting the



a demand for equipment. Local Distributors are contracted under the NCCoPP Equipment Support Scheme (ESS) to









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theme of best servicing practices have been circulated among the RAC fraternity. Eco-Cool, a regular newsletter for servicing technicians is published quarterly. In addition, flyers giving information about the project have also been distributed. The World in Our Hands, a video film, talks of the ill-effects of ozone depletion and urges technicians to join training and ensure a better world for our children. Additionally, the NCCoPP website is a crucial link in the information chain, providing regularly updated information on the project.

Information dissemination and creating awareness regarding CFC phase-out in India is of utmost importance to ensure the project's success. Various methods are being employed to create awareness: viz. video film, posters, newsletter, flyers, dealer workshops, equipment support workshops, articles in newspapers and a dedicated website.

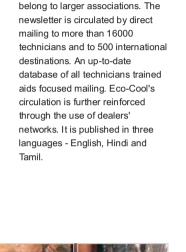


Posters have been printed to disseminate information about best servicing practices. Over three thousand copies have been distributed among refrigeration servicing technicians; equipment, spare parts and refrigeration dealers; industries; and project and training partners.



Newsletter

Information pertaining to the RAC service sector, updates in the field of refrigeration and air conditioning, tips on good servicing practices and other technical information is propagated through a first-of-its-kind newsletter: Eco-Cool for this target group. Utmost care is taken to ensure quality of the contents, a technical advisory team is nominated. The newsletter invites contributions and letters from technicians and each issue includes informative articles on new refrigerants and technology updates. The 'Cool Tips' are a special favourite with the technicians.



The training schedules are also

included in the newsletter. Eco-Cool

for servicing technicians who do not

offers the only means of affiliation

Video

The World in Our Hands a video prepared to generate awareness both among the general public and the refrigeration servicing technicians, to increase their business through participating in training in the use of CFCfree refrigerants.

Raju, a successful technician extols the aims of the project, the need for training and for understand the harmful effects of ozone depletion to Vinod, whose careless servicing practice discourages his clients. The video is aimed at both technicians and the general public. It is now available in English, Hindi, Bengali, Malayalam and Oriya.

Press Meetings

Networks are built with the local press to highlight specific events, publicise workshops and training programmes, as well as to disseminate information to the general public via press meetings. These are usually covered by the regional language press and audio-visual media, which enable a wider audience to understand the project and participate in CFC phase-out activities.

Workshops

Sector-specific information is disseminated through Dealer and Equipment Support workshops, which are conducted in all the major states.

Dealers Workshops

The dealers, be they spare parts or refrigerants dealers, are good points of contact for all refrigeration servicing enterprises (RSEs) to whom the

dealers sell their spares required by the technicians for servicing the appliances. Dealers help spread the message of NCCoPP objective and activities to the technicians. Hence the dealers can become an important 'agent for change' pointing out to technicians that they must start using new technologies and learn how to use them effectively.





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