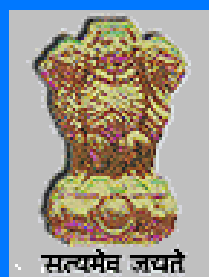




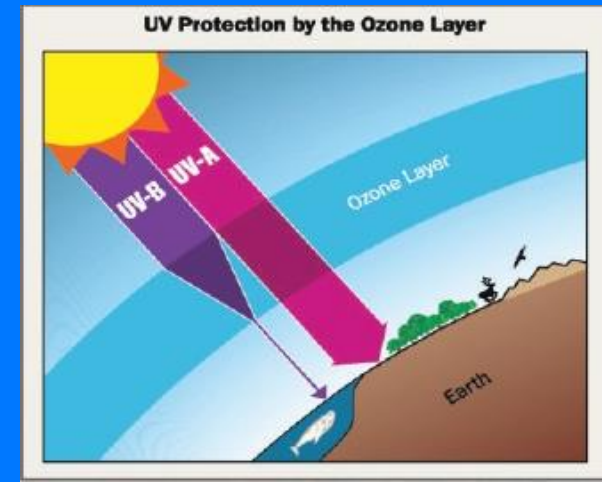
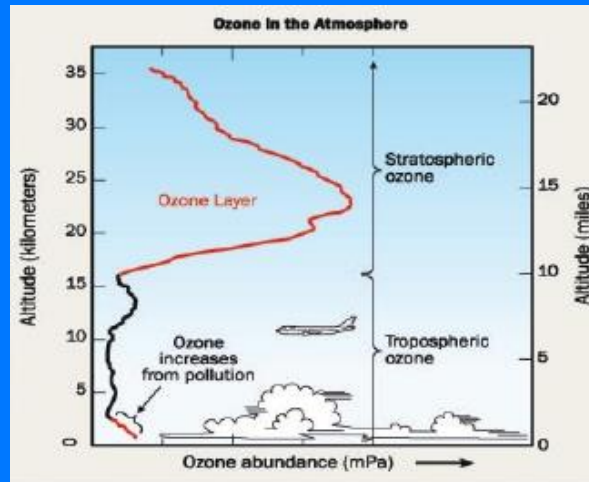
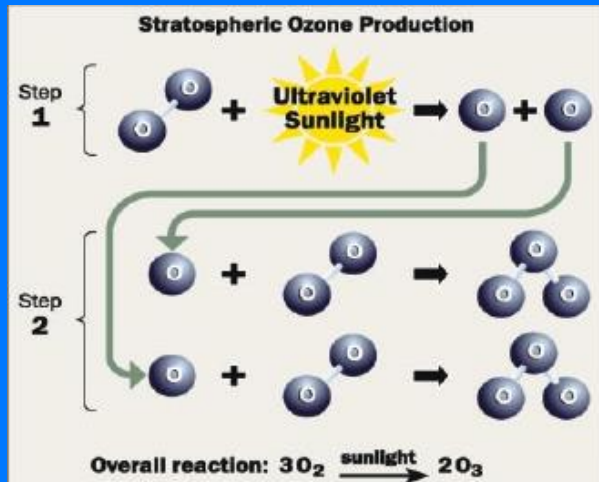
AWARENESS WORKSHOP FOR REFRIGERATION AND AIR-CONDITIONING (RAC) DEALERS ON GOOD SERVICING PRACTICES AND BETTER MAINTENANCE



OZONE CELL
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
GOVERNMENT OF INDIA



Introduction



- ❖ Ozone is a tri-atomic molecule of oxygen
- ❖ Formed naturally in the upper level of the Earth's atmosphere
- ❖ Three molecules of oxygen in the presence of sunlight form two molecules of Ozone in the Stratosphere
- ❖ Stratosphere extends between 10-50 kms above the earth surface
- ❖ 90% of the ozone formed in the atmosphere is present in the Stratosphere, hence called Stratospheric Ozone Layer
- ❖ Stratospheric Ozone Layer absorbs a large part of the Sun's biologically harmful UV-B ultraviolet radiation



OZONE LAYER DEPLETION

- **Ozone Depleting Substances (ODSs):** Chlorofluorocarbons (CFCs), Carbon tetrachloride (CTC), Halons, Methyl Chloroform, Methyl Bromide and Hydrochlorofluorocarbons (HCFCs).
- These chemicals are broken down by the UV radiation and release extremely reactive chlorine or bromine atoms.
- Chlorine / Bromine atoms undergo a chain reaction leading to destruction of stratospheric ozone.



Effects of Ozone Layer Depletion

- Human health :

- Damages DNA that suppresses immune system resulting in increase in infectious diseases

- Skin cancer

- Eye cataracts

- Plants & trees

- Reduces crop production, damage to seeds

- Reduces quality of crops



Effects of Ozone Layer Depletion

- Aquatic organisms

- Damages plankton, aquatic plants, shrimp & crab
- Affects marine food chain, damage to fisheries result

- Materials

- Paints, rubber, wood, & plastic degraded, especially in tropical regions
- Damages could cost extremely high (billions of US dollars)



Applications of Ozone Depleting Substances

- RAC appliances as refrigerant
- Spray / Aerosol based cosmetic and health products / industrial products
- Foam manufacturing (as blowing agent)
- Precision cleaning operations in industry
- Fire extinguishing systems
- Quarantine & Pre-shipment applications

Major uses of Ozone Depleting Substances

As a refrigerant in air conditioning equipment



As a foam blowing agent in foam manufacturing sector including foam insulation panels, thermoware, insulation for commercial refrigeration products, water heaters, etc.



As a fire extinguishing agent in fire extinguishing equipment.



Uses of Chlorofluorocarbons (CFCs), Carbontetrachloride (CTC), halons and methyl bromide have been phased out globally



VIENNA CONVENTION AND MONTREAL PROTOCOL

- ❑ The Vienna Convention for the Protection of the Ozone Layer was signed on **22nd March, 1985**.
- ❑ The Montreal Protocol on Substances that Deplete the Ozone Layer was signed on **16th September, 1987**.
- ❑ The Montreal Protocol has achieved universal ratification. 198 United Nations countries have ratified the Montreal Protocol.
- ❑ The Montreal Protocol is the most successful multi-environment agreement.
- ❑ **18th March 1991**: India became a Party to the Vienna Convention.
- ❑ **19th June 1992**: India became a Party to the Montreal Protocol.



OZONE DEPLETING SUBSTANCES (REGULATION AND CONTROL) RULES, 2000 AND ITS AMENDMENTS

- ❑ The Ozone Depleting Substances (Regulation and Control) Rules, 2000 under the Environment (Protection) Act, 1986 has been published in the Gazette of India on 19.7.2000.
- ❑ These Rules set the deadlines for phasing out of various ODSs, besides regulating production, consumption, trade, import and export of ODSs and the products containing ODSs.
- ❑ The Ozone Depleting Substances (Regulation and Control) Rules, 2000 have been amended in 2014 to align with the accelerated phase-out of HCFCs as per the adjustment of the Montreal Protocol at the 19th Meeting of the Parties (MOP) in September, 2007.
- ❑ A separate notification S. O. No. 4724 (E) dated 31st December, 2019, amending the Ozone Depleting Substances (Regulation and Control) Rules, 2000, was published in the Gazette of India inter alia prohibiting the issuance of import license for HCFC-141b from 1st January, 2020.



SALIENT FEATURES OF THE OZONE DEPLETING SUBSTANCES (REGULATION AND CONTROL) AMENDMENT RULES, 2014

- ☐ The production and consumption of Group VI substances (HCFCs) has been proposed to be controlled according to the accelerated phase-out schedule of the Montreal Protocol;
- ☐ Licensing system for import of HCFCs;
- ☐ Prohibition on import of HCFC based Air-conditioners from 1st July, 2015;
- ☐ Prohibition on manufacturing of Air-conditioners and RAC products with HCFCs from 1st January, 2025 to meet the 2025 phase-out target of 67.5%.

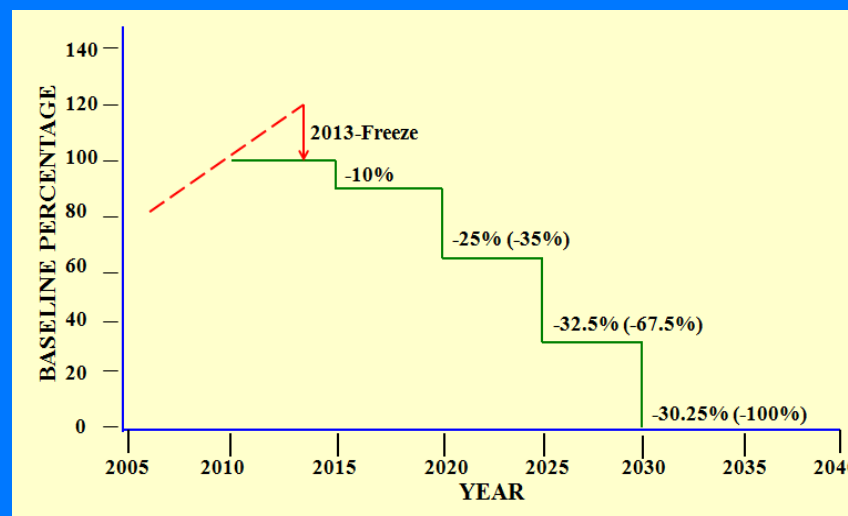


ACCELERATED PHASE-OUT OF HCFCs – ARTICLE 5 PARTIES (DEVELOPING COUNTRIES)

The 19th Meeting of the Parties (MOP) in its meeting held in September, 2007 decided to accelerate the phase-out of production and consumption of Hydrochlorofluorocarbons (HCFCs) by way of an adjustment to the Montreal Protocol (Decision XIX/6).

TIMELINE

- **Baseline** : average of 2009 and 2010 production and consumption
- **Freeze** : 2013
- **10% reduction of baseline in 2015**
- **35% reduction of baseline in 2020**
- **67.5% reduction of baseline in 2025**
- **100% phase-out in 2030**



Allowing for servicing an annual average of 2.5% during the period 2030-2040¹⁰



HPMP Stage-I Awareness - Key Outputs

Awareness Workshops

- 900 plus stake holders joined in
 - *One National Workshop, Three Regional Workshop and Six Dealers Workshop*

Promotional material

Flyer

“HCFC Phase-out Management Plan, Service Sector” printed and being distributed (30,000 copies)

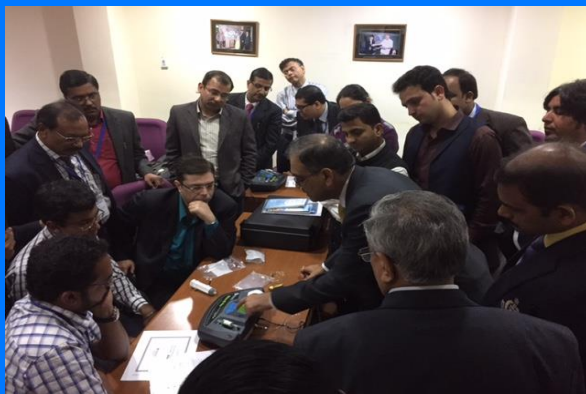
Poster (15,000 units)

Sticker (300,000 units) for servicing technicians printed and distributed.



HPMP Stage- I Enforcement - Key Outputs

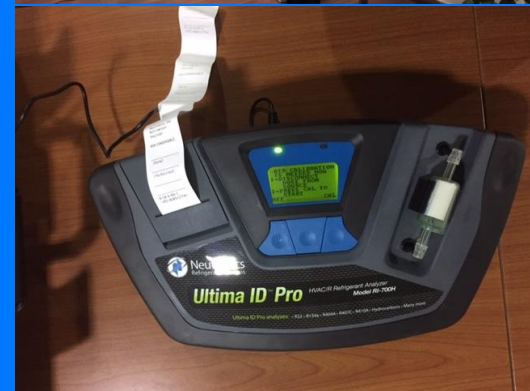
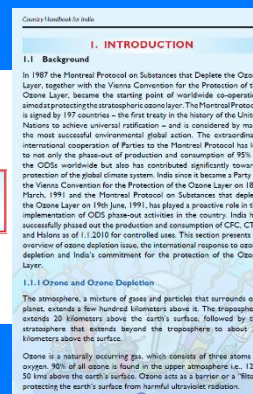
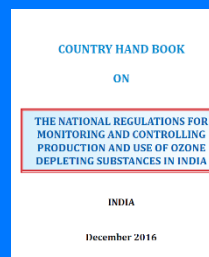
Train the Trainers Workshops,
Training of Custom Officers



Procurement and delivery of
Portable Refrigerant Identifiers



Publication of Country
Handbook for Custom





Newsletter for Technicians in Refrigeration and Air-conditioning (RAC) sector - newsTRAC

- Ozone Cell and UNEP in collaboration with The Energy and Resources Institute (TERI) is publishing a Quarterly Newsletter for Technicians in Refrigeration and Air-conditioning (RAC) sector in name of newsTRAC.
- Twelve issues of the newsletter for service technicians in RAC sector - newsTRAC- have been published and widely circulated.





Instructional training videos for RAC service technicians

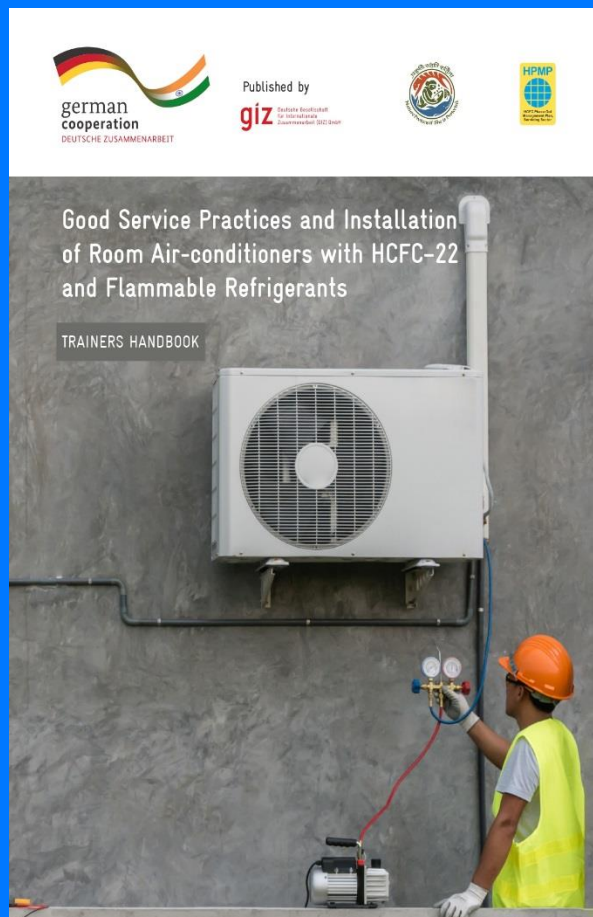
- Instructional training videos for RAC service technicians in different languages.
- The videos have been developed for the service technicians on various aspects of good servicing practices including topics:
 - ❖ Installation of Split AC
 - ❖ Flammable Refrigerant Handling
 - ❖ Good Service Practices
 - ❖ Recovery, Recycling and Reclamation
 - ❖ Basic tools overview
 - ❖ Evacuation of AC
 - ❖ Flaring
 - ❖ Leak detection
 - ❖ Refrigerant charging
- The videos have been jointly developed by the Ozone Cell and Energy Efficiency Services Ltd in collaboration with UNEP

Skilling of RAC service technicians

Publications related to RAC service sector which have been developed by Ozone Cell, MoEF&CC along with GIZ and UN Environment are made available on the website of Ozone Cell



Technicians Handbook



Trainers Handbook



Poster for Technicians



HPMP STAGE-II

- ❑ The 77th meeting of the Executive Committee (Ex-com) of the Multilateral Fund (MLF) held from 28th November, 2016 to 2nd December, 2016 approved HPMP Stage-II for India.
- ❑ Under HPMP II, India has secured 48.3 million USD from the Multilateral Fund for the Implementation of the Montreal Protocol for phasing out 8,190 MT or 769.49 ODP tonne of HCFC consumption between 2017 to 2023.
- ❑ 160 enterprises including Micro, Small and Medium Enterprises (MSMEs) in the foam manufacturing sector and 6 large air conditioning manufacturing enterprises would be supported under HPMP II for conversion from HCFCs to non-HCFC technologies.



POLYURETHANE FOAM SECTOR PLAN (UNDP)

- ☐ **Total agreed funding: US\$ 24,000,000**
- ☐ **Phase-out by 1.1.2020 – Complete phase-out of remaining calculated consumption of HCFC-141b from the baseline – 638 ODP tonne (5,800 metric tonne)**
- ☐ **Complete phase-out of HCFCs in foam manufacturing as on 1.1.2020**
- ☐ **Non-HCFC and Low-GWP alternatives**





REFERENCE PHOTOGRAPHS

PU FOAMING M/CS BASED ON ALTERNATE TECHNOLOGIES





AIR CONDITIONING MANUFACTURING (UNDP)

Conversion of HCFC-22 (ODS) based technology ACs to HFC-32 (Non-ODS) based technologies

- ❑ Total agreed funding:
US\$ 12,511,459
- ❑ Phase-out by 1.1.2023:
62.70 ODP tonne (1,140
metric tonne HCFC-22)
- ❑ Conversion in 6 large
enterprises (10
production lines)
- ❑ To convert to HFC-32
technology





HPMP STAGE-II – ENABLING COMPONENT- UN ENVIRONMENT

- ❑ Customs & Enforcement capacity building activities comprising of training of trainers, capacity building workshops for customs & enforcement officers, and hold border dialogue with neighbouring countries on specific ODS trade related aspects
- ❑ Promotion of non-ODS alternatives (in particular Low GWP technologies) public procurement practices
- ❑ Linkage of the Energy Efficiency and servicing practices for RAC products,
- ❑ Building sector interventions to understand the space cooling demand from Buildings in India and identify opportunities for non-ODS and low GWP Technology applications
- ❑ Standards for RAC Sector
- ❑ Cold Chain sector interventions to study the application of non ODS and low GWP technologies in Cold Chain sector in India
- ❑ Database of service technicians



"Quick guide" on good servicing practices on handling flammable refrigerants

- Ozone Cell released the booklet on Good Servicing Practices for Flammable Refrigerants: A [Quick Guide](#) on the occasion of the World Ozone Day held on 16th September, 2019.
- EESL will reprint the copies for dissemination to service technicians.





Training and Certification of Refrigeration and Air-conditioning Service technicians under Skill India Mission

- The Ozone Cell had developed a project jointly with the Electronic Sector Skill Council of India (ESSCI) for upskilling and certifying 100,000 RAC service technicians under the Skill India Mission - Pradhan Mantri Kaushal Vikas Yojana (PMKVY) of Ministry of Skill development.
- Livelihood opportunities of the RAC service technicians working in the informal sector.
- Significant positive environmental impacts through reduction leakage of refrigerants and increase in the energy efficiency .
- Under the project till date about 60,000 service technicians have been trained.
- A [mobile application](#) developed by Electronic Sector Skill Council of India and Ozone Cell for the trainees under the project for continuous information exchange with the service technicians





For more information

Fahad Naim

Ozone Cell / United Nations Environment Programme

Email: pmucfc-mef@nic.in / fahadnaim19@gmail.com

Website: <http://ozonecell.nic.in/>