

COUNTRY EXPERIENCES WITH LIFE-CYCLE REFRIGERANT MANAGEMENT

Country: **INDIA**

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Overview of National LRM Framework

- In India, end of life RAC equipment is covered under E-waste regulations
- For the sound management and disposal of E-waste, India has notified the E-waste (Management) Rules 2022 under the Environment Protection Act 1986.
- Necessary provisions have been introduced in the E-waste (Management) Rules through an amendment notified on 24th July 2023 for appropriate management and disposal of refrigerants at the end-of life of RAC equipment
- Guidelines for implementation of the Rules are being framed.
- Extended Producer Responsibility (EPR) has also been introduced as part of the E-Waste (Management) Rules 2016, which include provisions for managing electronic waste and associated refrigerants by equipment manufacturers.



Implementation Experience and Key Actions

- Management of end-of-life refrigerant is covered in the training curriculum of RAC service technicians
- Initiatives in servicing sector
 - Strengthening training to include Recovery, Reclamation and Re-use (RRR) of refrigerants
 - Certification system for service technicians
 - Creation of a service under the Government e Market (GeM) Portal to enable procurement of trained and certified service technicians by government departments and organisations
- The requirement for responsible management of refrigerants has been established, and applies to manufacturers, refurbishers, and recyclers throughout the product lifecycle
- There is a mandate for approved destruction technologies, overseen by the Central Pollution Control Board (CPCB)
- Compliance with Extended Producer Responsibility (EPR) is an essential component in India moving forward towards environmental sustainability. Manufacturers/producers responsible for end-to-end lifecycle of product/equipment which also includes RAC equipment
- The CPCB has issued guidelines for environmentally sound facilities for handling, processing and scrapping of vehicles at the end of life, in which management of refrigerant gases has been duly addressed



Results and lessons learned

- Transition towards the waste-to-resource paradigm needs a circular economy model. The model requires to eliminate waste through the advanced design of materials, products, systems, and value chains
- Competency enhancement of small and medium-sized enterprises (SMEs) in utilising energy-saving and environmentally friendly technologies
- The refrigerant recovery with adequate purity levels to be recycled and reused is a major challenge to be addressed
- Considering the complex design of equipment, dismantling and recovery of refrigerant becomes more difficult for the untrained technician. Unified Certification system for service technicians along with training is an important way forward to address this challenge.
- High infrastructure and associated costs comprising storage and transportation of contaminated refrigerants to the reclamation or destruction facility are serious deterrents.
- Absence of financing mechanisms is a disincentive to recover and subsequently, recycle, reclaim, or destruct the refrigerants at the end-of-life of equipment.



Thank you!

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