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*for a sustainable future*

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# FIXING FRIDGES HELPS SAVE THE PLANET

## How can a fridge or freezer damage the environment?

Fluids in refrigeration equipment – in fridges, freezers, cold storage, and air conditioners – often contain chemicals that damage the ozone layer and contribute to climate change. This decoupling is an integral part of inclusive and sustainable industrial development (ISID) processes.



Servicing these appliances is vital to ensure that they are working properly and that no harmful chemicals are released. The refrigeration sector is not only one of the main sources of ozone depleting substances worldwide, but in many countries it is the only source. The majority of refrigerant emissions can be attributed to lack of maintenance and inappropriate servicing. During the product's lifetime, refrigerant leakage can occur during manufacture, installation, operation, servicing and even when the equipment is not being used. Refrigerant leakage is often resolved by frequent refrigerant recharge or top-up, which fails to repair the leakage and is a typical example of poor servicing practice.

## Crusade for the climate

The Montreal Protocol on Substances that Deplete the Ozone Layer is an international environmental treaty which protects the ozone layer by phasing out the production and consumption of ozone depleting substances. As an implementing agency of the Montreal Protocol, UNIDO assists developing countries to phase out ozone depleting substances.

Refrigerant leakage is a significant source of chemical emissions which may not only deplete the ozone layer but can also cause global warming. Leakage also leads not only to poor performance of refrigeration or air conditioning equipment, but also high energy costs. It is clear that service technicians have an important role to play, both in ensuring the equipment's efficient and safe operation, and protecting the environment. While installing, maintaining and repairing equipment, service technicians follow guidelines provided by the Montreal Protocol and several international and national standards, which ensure that the procedures are carried out in the safest and most environmentally friendly manner.

### What?

Periodic routine inspections and maintenance of refrigeration appliances, such as refrigerators, freezers, and air conditioners

### Who?

Service and maintenance technicians, trained and certified by an approved programme in both theory and practice, in different categories, and with different responsibilities

### Why?

Because inefficient equipment and breakdowns are expensive, potentially dangerous, and damaging to the environment

In order to minimize the emission of ozone depleting substances, the reuse of refrigerants by technicians is strongly encouraged after appropriate recovery and purification.

Different countries have different legal frameworks and service structures for the reuse of refrigerants. Reuse can be organized in a centralized, decentralized or semi-centralized way, depending on the local recovery and recycling possibilities. The best solution is reclamation at a central facility. Reclamation returns the recovered refrigerant to its original characteristics. These facilities, however, are often not available in developing countries, which means that recycling – or basic purification – is the only option. Also, the existing reclamation centers, typically located at large service companies, training, educational or governmental institutions, are not used to their full potential, due to the lack of predefined business modalities.

→ **Recovery:** Collection and storage of refrigerants from machinery or equipment during servicing

→ **Recycling:** The reuse of a recovered substance following a basic cleaning process such as filtering and drying, without any criteria for reducing contamination. For refrigerants, recycling normally involves recharge back into equipment, which often occurs **on-site**

→ **Reclamation:** The re-processing and upgrading of a recovered substance through filtering, drying and distillation in order to restore the substance to the same properties as virgin refrigerant. This almost always involves processing **off-site at a central facility**

## Training super technicians

The training of technicians is a strong element of most of UNIDO's ongoing Montreal Protocol projects. The focus has shifted from quantity to quality; the new target is to educate "super technicians", who are real masters of their work and can provide training for future generations.

Training activities are always preceded by the purchase of training equipment and the establishment of a curriculum. The activities conclude with the certification of participating technicians. All these activities are organized in close cooperation with national and international project partners, such as the National Ozone Units (usually part of

a Ministry of Environment), training institutes, vocational schools, refrigeration associations, cooperating Montreal Protocol implementing agencies and other partners.

UNIDO's main goal is to strengthen the profile of refrigerant reuse, in order to make it more sustainable and profitable in the long-term. By doing so, more technicians will be motivated to recover refrigerants and perpetuate the cycle of reuse. Such efforts are currently ongoing in some West Asian countries, as well as in Tunisia and Mexico, where UNIDO is committed to establishing reclamation centers with solid business models.



## Empowering end users

Since the demand side of the refrigerant market is shaped by the end users – that is, the owners of the installations – these end users have the power to influence trends. Awareness of the downsides of low quality refrigerants and frequent equipment recharge can lead to different consumer decisions. This is what UNIDO and its partners target, through various awareness raising activities: to empower end users to make better choices when buying refrigerants and to select properly trained technicians.

UNIDO is committed to changing unfavorable market trends through project interventions, and promoting the use of ozone friendly and climate friendly natural refrigerants – like hydrocarbons, carbon dioxide, and ammonia – in new installations.

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