

# MONTREAL PROTOCOL INFORMATION SHEET

25 Years of the Montreal Protocol



20 Years of UNIDO Implementation

## Montreal Protocol

### What's in your fridge?

Up until the Antarctic ozone hole was discovered in 1985, the most commonly used **refrigerants** were CFCs (chlorofluorocarbons), namely CFC-11 and CFC-12, aka R-11 and R-12. CFCs were first introduced in 1928. They are non-toxic, and due to their optimal thermodynamic properties, are efficient refrigerants. Moreover, the **insulation foams** lining the cabinet walls and doors of our refrigeration units were made using CFCs. In the manufacturing process, CFCs are employed as foam blowing agents, giving plastic foams their foamy property. However, CFCs are potent ozone depleting substances (ODS), posing a threat to the ozone layer when released into the atmosphere. CFCs also contribute to climate change, due to their greenhouse gas properties.

Therefore, in line with the Montreal Protocol compliance targets, developed countries phased-out their production and use of CFCs by 1996; developing countries were given until 2010. In the early years of Montreal Protocol, CFCs were replaced by HCFCs. Even though HCFCs have a lower ODP than CFCs, they still have a significant GWP, which explains why they were considered “transitional” alternatives until greener technologies had time to mature.

CFCs were also replaced by HFCs. HFCs, albeit having zero ODP, generally have high GWP. As an implementing agency of the Multilateral Fund of the Montreal Protocol, UNIDO has promoted the use of non-transitional, zero ODP and low GWP alternatives. An example of this is the adoption of hydrocarbons as refrigerants and foaming agents.

Refrigerants are not only used to cool our refrigerators, they are also used in our freezers, air-conditioners, cooled storage rooms and chillers – large cooling installations used to centrally cool large buildings such as hospitals, hotels, office buildings, etc.



KEY: CFC – chlorofluorocarbons · HCFC- hydrochlorofluorocarbons · HFC – hydrofluorocarbons · ODP – ozone depleting potential, reference value given as ODP=1.00 for CFC-11 · GWP – global warming potential