

Reasons why your company should get involved:

- Avoid being faced with limited HCFC supply and HCFC use restrictions in the future
- Keep up-to-date with the latest technologies
- Protect your company's future profitability
- Maintain export markets
- Show your company as an example of a green business

What steps should your company consider?

- If your equipment is old, consider replacing your existing HCFC technology with a new one that uses ozone- and climate-friendly alternatives — see chart
- Only select non-HCFC technology when purchasing new equipment
- Establish refrigerant emission controls
 - use leakage detectors
 - establish equipment leak checking schedules
 - order immediate leak repairs by qualified/certified personnel
- Promote refrigerant recovery, recycling and reclamation
- Train/certify your personnel
- Introduce alternative technologies
- Keep equipment logbooks

What aspects should be considered when selecting an alternative technology?

- Technical aspects
 - performance in your local conditions (temperature, humidity)
 - size/weight
- Environmental aspects
 - Global Warming Potential (GWP) of the refrigerant
 - equipment TEWI/LCCP
- Economic aspects
 - annual energy consumption
 - maintenance cost
 - initial investment cost
- Safety aspects
 - refrigeration flammability
 - explosion risk
 - refrigerant toxicity

Assistance is available!

Financial and technical assistance is available under the Montreal Protocol's Multilateral Fund for technology conversion projects, training and other activities for eligible companies in developing countries. The assistance is provided within the framework of HCFC Phase out Management Plans (HPMPs) and delivered through international organizations (UNDP, UNEP, UNIDO, World Bank) and bilateral agencies.



You can find additional information about alternative technologies on UNEP DTIE OzonAction's HCFC Help Centre:
<http://www.unep.fr/ozonaction/topics/hcfc.asp>

Contact your National Ozone Unit to find out how your company can qualify for this assistance



HCFCs

in the Refrigeration and Air Conditioning sector

How to prepare for the phase down



HCFCs

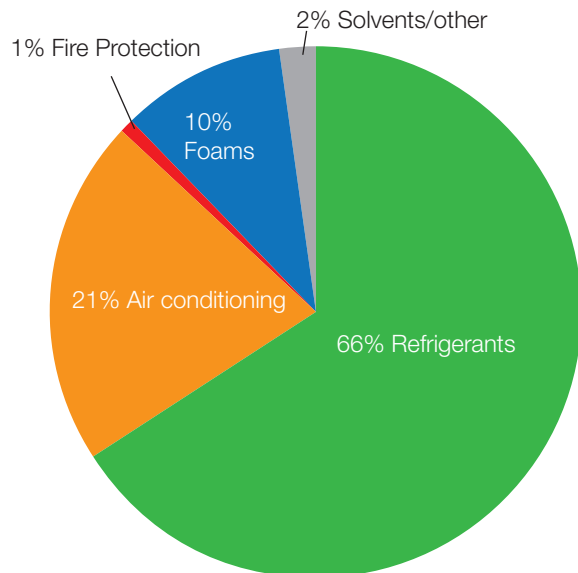
How to prepare for the phase down?

What are HCFCs?

Hydrochlorofluorocarbons (HCFCs) and HCFC-containing blends are man-made chemicals widely used as refrigerants, foam blowing and fire extinguishing agents, aerosol propellants, solvents and as feedstock in chemical production. Approximately 75% of global HCFC use (including feedstock use) is in the refrigeration and air conditioning (RAC) sector. The main HCFC used in this sector is R-22. HCFCs are also used in many refrigerant blends.

Where are HCFCs used in this sector?

The main applications of HCFCs refrigerants are in commercial and industrial refrigeration, refrigerated transport, heat pumps, air conditioners and chillers.



Why do HCFCs have to be replaced?

HCFCs are ozone-depleting substances, subject to worldwide production and consumption phase out schedules agreed under the international treaty known as the Montreal Protocol. HCFCs can deplete the Earth's protective stratospheric ozone layer, and they are also potent greenhouse gases which can seriously contribute to climate change.

Montreal Protocol HCFC consumption phase out schedule for developing countries

HCFC consumption = production + imports - exports	
Base level : Average consumption for 2009 and 2010	
1 January 2013	Freeze
1 January 2015	10% reduction
1 January 2020	35% reduction
1 January 2025	67.5% reduction
1 January 2030	100% reduction*

*while allowing for servicing an annual average of 2.5% of the baseline during the period 2030-2040



photo courtesy of Plastics Bavaria

photo courtesy of Hennecke GmbH

What alternatives are available to replace HCFCs in the RAC sector?

Climate friendly (low GWP) alternatives are marked in yellow
Emerging climate friendly technologies → HFO-1234yf

Equipment Type	Zero ODP Alternatives
Refrigeration	
Domestic Refrigerators	HFC-134a, HFC-413a, hydrocarbons
Stand alone Retail Food Equipment	HFC-134a, R-404a, hydrocarbons, CO₂
Vending Machines	HFC-134a, hydrocarbons, Stirling and transcritical CO₂ technology
Condensing Units	R404A, R-507A
Large Supermarket Systems	HFC-134a, R-404A, R-407C, R-417A, R-422B, distributed systems (using HFCs, HCs or CO₂), indirect systems (using HFCs, ammonia, hydrocarbons or CO₂), Two-stage cascading systems using CO₂
Cold Storage	HFC-134a, R-404A, R-410A, R-507A, hydrocarbons, ammonia, CO₂, distributed systems (using HFC, HCs or CO₂), indirect systems (using HFCs, ammonia, hydrocarbons or CO₂)
Refrigerated Transport	HFC-23, HFC-134a, R-404A, R-407C, R-410A, R-507A, ammonia, CO₂, hydrocarbons
Industrial Process Refrigeration	HFC-134a, R-404A, R-507A, ammonia, CO₂, water, distributed systems (using HFCs, HCs or CO₂), indirect systems (using HFCs, ammonia, hydrocarbons or CO₂)
Air Conditioning	
Heat Pump	HFC-143a, R-404A, R-407C, R-410A, hydrocarbons, ammonia, CO₂
Unitary AC (ducted and non-ducted)	HFC-143a, R-404A, R-407C, R-410A, hydrocarbons, ammonia, CO₂
Window Units	HFC-143a, R-407C, R-410A, R-417A, R-419A, R-422B, hydrocarbons, CO₂
Packaged Terminal Air Conditioners (PTAC)	R-134a, R-404A, R-407C, R-410A, hydrocarbons, ammonia, CO₂
Chillers	HFC-134a, HFC-245fa, R-407C, R-410A, ammonia, hydrocarbons