

**PHASE DOWN OF HFCs  
CURRENT DECISIONS AND CHALLENGES**

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# Outline

- 1) The situation before Kigali
- 2) The Kigali amendment and decisions to be taken
- 3) Challenges and solutions

# 1/ The situation before Kigali

- 2 secretariats within UNEP, 2 different issues:
  - Climate change + Ozone layer
  - Rio Convention/Kyoto Protocol + Montreal Protocol
    - CFCs, HCFCs → Montreal Protocol
    - HFCs (+CO<sub>2</sub>, CH<sub>4</sub>...) → Rio
- The ozone layer is recovering, thanks essentially to the phase out of CFCs
- The GWP of HFCs is (on average) similar to HCFCs

- HFCs are essentially used for refrigeration and air conditioning (+ foams) as well as HCFCs: they progressively replace them
- HFCs are short-lived climate pollutants
- The Montreal Protocol is a success. Montreal Protocol tools are efficient (ozone officers, MLF...)  
Climate Change tools are still to be established
- ➔ the proposal: continuing to count HFC emissions within other greenhouse gas emissions (UNFCCC) but using the Montreal Protocol tools to reduce these emissions
- ➔ amendments to the Montreal Protocol since 2009

## 2/ The Kigali amendment and decisions to be taken

	A2 countries	A5 countries (Group 1)**	A5 countries (Group 2)***
<b>Baseline</b>	<b>2011-2013</b>	<b>2020-2022</b>	<b>2024-2026</b>
<b>Formula</b>	<b>Average HFC consumption</b>	<b>Average HFC consumption</b>	<b>Average HFC consumption</b>
<b>HCFC</b>	<b>15% or 25% baseline*</b>	<b>65% baseline</b>	<b>65% baseline</b>
<b>Freeze</b>	<b>-</b>	<b>2024</b>	<b>2028</b>
<b>1st step</b>	<b>2019 – 10%</b>	<b>2029 – 10%</b>	<b>2032 – 10%</b>
<b>2nd step</b>	<b>2024 – 40%</b>	<b>2035 – 30%</b>	<b>2037 – 20%</b>
<b>3rd step</b>	<b>2029 – 70%</b>	<b>2040 – 50%</b>	<b>2042 – 30%</b>
<b>4th step</b>	<b>2034 – 80%</b>		
<b>Plateau</b>	<b>2036 – 85%</b>	<b>2045 – 80%</b>	<b>2047 – 85%</b>

\* Belarus, Russia, Kazakhstan, Tajikistan, Uzbekistan

\*\* Group 1: Article 5 parties not part of Group 2

\*\*\* Group 2: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, India, Iraq, Iran, Pakistan

- Oral approval → amendment to be signed and ratified by all parties
- Proposals discussed in Kigali to be formally adopted and to be implemented
  - additional funds to the MLF
  - new rules for the MLF: energy efficiency, priorities / sectors, country / country...
  - stationary air conditioning and hot climates
  - Links between Montreal protocol secretariat and ISO
  - New TEAP reports on alternatives
  - How to follow and eventually modify national phase down plans

# 3/ Challenges and solutions

→ Increasing needs → increasing capacities

growth in global population, particularly in Africa and South Asia

Cold chain capacities (storage, transport, commercialisation, domestic refrigeration) are tenfold less in developing countries

IPCC forecasts an increase in energy demand in air conditioning in the summer 30 fold by 2100 under its reference scenarios

→ We need to ensure the sustainability of new equipment

→ Energy consumption of refrigeration equipment, including air conditioning equipment, must be reduced. Or using renewable energy: heat pumps, solar energy...

**Latest estimation (\*):** 17% of the worldwide electricity consumption → lack of energy infrastructures and indirect global warming impact (the most important one)

Financial and regulatory initiatives in the field of energy must accompany those regarding HFCs

- Combining HCFC phase out and HFC phase down, reducing leakage or the charge of refrigerants + replacing high GWP refrigerants by low GWP refrigerants  
old equipment vs new equipment  
solutions application by application
- safety requirements: adopting safety regulations and standards, since low GWP refrigerants bring higher risks in matters of safety

**(\*) IIR Informatory Note**



- **Works at an international level**

- Adapting new standards: safety requirements for A3 and A2L refrigerants; works with ISO and IEC
- Links with UNFCCC regarding energy consumption plans, actions and forecasts: energy efficiency in buildings, vehicles, factories; development of renewables
- Coalitions IIR-UNEP-UNIDO... and links with international and regional associations and companies

- **Works at national levels**

- Adopting new regulations and standards on safety issues, based on the state of the art of technical solutions and international evolutions  
Adopting new regulations and standards on energy efficiency, coherent with phase out and phase down schedules of refrigerants  
(not obvious!)
- Financial incentives for investors and information to companies (SMEs...)
- Training and certification of technicians

- **Works in universities, research organisations, research centers of international companies**
  - Increasing R&D on HFOs and blends: a lot of new refrigerants will appear on the market: be careful (efficiency; short term or long term solution; neutrality of information)
  - Increasing R&D on natural refrigerants, especially CO<sub>2</sub> (the South way!)
  - R&D on low charge, on containment

- No hope to have totally new solutions in the near future, except in niches with not-in-kind technologies (magnetic refrigeration, solar refrigeration...)

- ➔ **do not wait!**

- ➔ start with **“easy”** applications: domestic refrigeration, small equipment in air conditioning, display cabinets...

Scientific, objective, hands-on and updated information on the available or upcoming technologies, on their potential usages and their pros and cons, is crucial.

The IIR is in position to provide this to you.

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# refrigeration



Thank you!