PHASE DOWN OF HFCs
CURRENT DECISIONS AND CHALLENGES

BELGRADE, SERBIA

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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 (+CO₂, CH₄...) ➔ 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 (UNFCC) **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

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

* 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 UNFCC 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$_2$ (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!