Green Industry

UNIDO
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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Introduction and Adoption of Low-Carbon Technologies through the Implementation of the Montreal Protocol

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Montreal Protocol

- **Text**
  - **Objective:** protecting the ozone layer by phasing out the production and consumption of Ozone Depleting Substances
    - Refrigerants (HCFCs, CFCs)
    - Foam blowing agents (HCFCs, CFCs)
    - Aerosols (CTC, TCA,..)
    - Solvents (CTC, TCA,..)
    - Methyl bromide in fumigation and grain storage

- **Funding**
  - Multilateral Fund
  - Bilateral Funding (France, Italy, Japan, Spain)

- **Implementing Agencies**
  - UNDP
  - UNEP
  - UNIDO
  - World Bank
Implementing the Montreal Protocol in the MENA Region

21% of UNIDO MP projects are implemented in the region: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia and Yemen

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Types of projects</th>
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<tbody>
<tr>
<td>• Refrigeration manufacturing</td>
<td>HCFC phase-out: HPMPs, individual investment projects</td>
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<td>(domestic and commercial appliances)</td>
<td>Demonstration projects:</td>
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<td>• Refrigeration servicing</td>
<td>• Disposal and destruction of ODS stockpiles and ODS-containing equipment</td>
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<td>• Foam manufacturing sector</td>
<td>• Chiller replacement projects</td>
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<tr>
<td>(polyurethane foam, extruded polystyrene foam, etc.)</td>
<td>Methyl bromide phase-out projects</td>
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<tr>
<td>• Aerosols and solvents</td>
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<td>• Fumigation</td>
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Countries assisted through:

Technology transfer

Training Workshops

Capacity Building
Montreal Protocol commitment to low-carbon technology

<table>
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<th>CFC alternatives in the refrigeration and foam sectors:</th>
<th>1993-2010: UNIDO implemented 1340 MP projects.</th>
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<tr>
<td>• HCFC (lower ODP, significant GWP) – transitional</td>
<td>Introduction of ODS-free, low-GWP technology resulted in the phase-out of approx. 70,300 ODP tonnes and emissions reductions of GHG of around 359 million tonnes of CO2eq.</td>
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<tr>
<td>• HFC (zero ODP, high GWP)</td>
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<tr>
<td>• Hydrocarbons (zero ODP, insignificant GWP)</td>
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Montreal Protocol commitment to low-carbon technology

Formal discussion on the introduction and adoption of low-GWP alternatives at the 19th Meeting of the Parties of the Montreal Protocol (Decision XIX/6), 17-21 September 2007

Executive Committee of the Multilateral Fund set up a Multilateral Fund indicator (Decision 59/45, Addendum 62nd ExCom Meeting), 10-14 November 2009

- All new project proposals must include a climate benefit impact
  - Ensure for green and sustainable solutions
  - Source additional funds for project: environmental funds, carbon market, etc.
An example: UNIDO introduces natural refrigerants

- Launch of first domestic refrigerators using natural refrigerants in Germany
- First Projects in China completed with significant positive impact on ozone and climate
- UNIDO initiates the introduction of novel refrigerator manufacturing technologies using HC refrigerants & foaming agents in Article 5 countries – China as a pilot
- UNIDO has 71 projects (completed and ongoing) using natural alternatives in the refrigeration sector
Financing & costs lowered through innovative solutions

**Barriers**

- Higher cost of natural refrigerants (HC, ammonia, etc.)
- Superior cost-effectiveness threshold
  - especially for SMEs
- Cheap refrigerant alternatives e.g. HFCs already available on the market

**Solutions**

- Adapted financing programs e.g. revolving funds
- Accessing the carbon market, using climate benefit component of natural refrigerants
- Introduction of incentives & disincentives:
  - Taxes on high GWP alternatives
  - Tax relief on lower GWP alternatives
# Added safety issues

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<th>Barriers</th>
<th>Solutions</th>
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<td>- Handling of flammable and toxic refrigerants</td>
<td>- Safety precautions (plant layout)</td>
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<td>- Limited space</td>
<td>- Mature technology</td>
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<td>- Storage</td>
<td>- TÜV certification</td>
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<td>- Lack of awareness – reluctance to convert to natural refrigerants</td>
<td>- Promote further demonstration projects on adapting HC technology</td>
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<td>- Training for technicians (handling refrigerants, storage, etc.)</td>
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<td>- Raise awareness of company owners and public</td>
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Technology processes can be enhanced through partnerships

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<th>Barriers</th>
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<td>- Availability of appropriate technology upstream and downstream of supply chain</td>
<td>- Fostering partnerships: Company partnerships and Government help</td>
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<td>- Promote demonstration projects to ensure acceptance &amp; future investments in natural refrigerant technology</td>
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<td>- Stakeholder involvement: key players as first movers</td>
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Developing global standards decreases doubts

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<th>Barriers</th>
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<td>• Lack of national and international policy to promote the adoption of HC</td>
<td>• Synchronization between Montreal &amp; Kyoto Protocols; especially on HFCs</td>
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<td>• Safety standards in some countries preventing from opting for HC</td>
<td>• Assistance to governments to implement standards incl. tax incentives/disincentives</td>
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<td>• Influence on relevant lobbies</td>
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Chiller replacement projects

Example of linking the Montreal Protocol with Kyoto Protocol objectives

Demonstration projects: Africa (Egypt), West Asia (Syria)

- Aim: To accelerate the replacement of CFC-charged chillers with ODS-free, energy-efficient ones

- Co-financing: subsidies, direct counterpart contribution, financial institutions (revolving loan funds)
HCFC Phase-out

- HPMP and HCFC phase-out projects: Algeria, Morocco, Bahrain, Iraq, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, Oman, Kuwait, Libya, Yemen

- Refrigeration (refrigerator, freezer and a/c) and Foam manufacturers have:
  - Avoid adoption of HFC or other GHG alternatives whilst converting production lines
  - Subsidies for producer and end-users alike
  - Guidance from Government

For countries with high ambient temperatures:
  Available alternatives not always suitable. Technology has to mature, to ensure low-carbon technologies are employed.
Conclusion

- Actions for a concerted effort have to be taken to overcome actual barriers to zero ODP, low-carbon alternative technology:
  - Financing & costs are lowered by more innovative solutions
  - Safety issue can be overcome through increased knowhow
  - Technology processes can be enhanced through partnerships
  - Developing global standards relaxes national anti-HC policies

Lessons learnt from completed and ongoing projects can be employed to facilitate the move towards, green sustainable solutions.

Opting for zero ODP and low carbon technology has a significant positive impact on ozone protection (MP) and climate change mitigation (KP) vs. the use of HFCs and other high GHG alternatives.
Thank you

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