



# **Phase-out of HCFCs**

**Montreal Protocol Unit / Chemicals  
UNDP**

**Caribbean Ozone Officers Regional Workshop  
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# Montreal Protocol & HCFCs

- ❑ Baseline: average consumption 2009-2010
- ❑ Short and long term goals:
  - ❑ Freeze in 1/Jan/2013,
  - ❑ 10% reduction from 1/Jan/2015,
  - ❑ 35% reduction from 2020.
- ❑ Short time to meet 2015 obligations!



## HCFC Consumption Profile in A-5 Countries

- **HCFC-141b** is predominant in Polyurethane Foams production. **GWP = 713** and lower quantities for flushing in RAC services
- **HCFC-22** (manufacturing and servicing) in AC sector is highly significant! **GWP = 1,810**
- **HCFC-123** at minor extent as refrigerant in Chillers **GWP = 73**
- **Others HCFCs** used in commercial blends for RAC servicing sector **GWP = 700 ± 2,000**

## Polyurethane (PU) Foam Sector

- ❑ UNDP is supporting countries in the HCFC-141b phase-out;
- ❑ PU market is facing external demand from consumers looking for “greener products” (i.e.: blowing agents that are not HCFC-based and with the lowest GWP possible);
- ❑ Countries, at their maximum extent, tend to follow the Excom’s decision to prioritize the phase-out of high-ODP HCFCs first, but there are:
  - ❑ Dependency on the size of PU Industry (HCFC consumption);
  - ❑ Dependency on low-GWP alternatives commercially and technically available within the country for the specific PU applications.

# Refrigeration and Air Conditioning Sectors

- ❑ Countries with low/none HCFC141b consumption had to prioritize the RAC manufacturing sector to meet their phase-out targets (2013-2015) reaching 2020 obligations;
- ❑ AC Market is growing fast in developing countries. The equipments are energy intensive (contributing to indirect CO2 emissions due energy consumption);
- ❑ UNDP is supporting several countries in the HCFC-22 phase-out in RAC sector;



# Technology Choice

- ❑ MOP Decision XIX/6 (2007): countries should also consider climate: GWP, Energy Efficiency, Containment!
- ❑ Energy Efficiency and GWP considerations are essential in the choice;
- ❑ CO<sub>2</sub> emissions in RAC sector are significant during the product life cycle, mainly due venting;
- ❑ Selection of HCFCs alternatives involve commitments and balanced analysis: *cost-effectiveness, health, environment and safety issues to be balanced with product stability, processability and life cycle*
- ❑ In the end, the Industry and their clients will lead the technology choice based on such criteria and applied to the country's reality...

# Technology Perspectives: PU Foam

- ❑ Wide list of ready-to-use alternatives:
  - ❑ Hydrocarbons
  - ❑ HFCs (\*high GWP)
  - ❑ H<sub>2</sub>O
  - ❑ CO<sub>2</sub>
  - ❑ Methylal
  - ❑ Methyl Formate
  
- ❑ Emergent technologies: unsaturated HFCs (HFOs);



# Technology Perspectives: RAC

- ❑ R-410A (GWP = 2,088\*) has been the preferred alternative in developed countries since 2000 for AC applications;
  - ❑ The major technology providers for the developing countries demonstrate preference over HFC-410A, and it is fully available in the market
- ❑ HCs (R600a) being widely adopted in Domestic Refrigeration;
- ❑ CO2 pilot plants in supermarkets being installed in LAC;
- ❑ Ammonia has a specific niche in industrial applications ;
- ❑ Potential uses of HFC-32 and HC-290 in Window and Split AC units;
- ❑ HFCs commercial blends in servicing sector, retrofit.

\* IPCC 4<sup>th</sup> Assessment Report



## Key Points

- The reduction in the HCFC-22 consumption in developing countries, without a clear legal/technological positioning, may result in adverse impacts to the climate regime;

*e.g.:* if the developing countries forbid the HCFC-22 based units (production and imports), the “automatic” alternative for AC would be HFC-410A...

**HCFC-22 (GWP: 1,810) ----- HFC-410A (GWP: 2,088)**

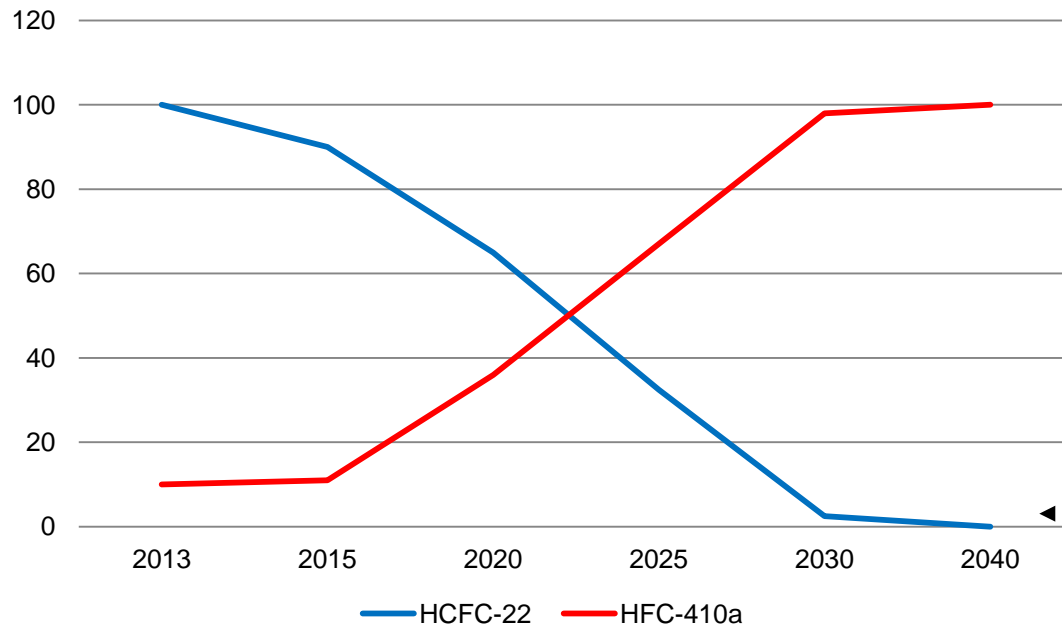
\* IPCC 4<sup>th</sup> Assessment Report



# Climate Impacts

## *HCFC-22 Case Study*

Considering the “automatic conversion” from HCFC-22 to HFC-410A, the efforts for the climate regime made under the Montreal Protocol may be overcome by the growth in the consumption of high GWP substance...(in terms of CO<sub>2</sub>-eq):



## Concerns

- ❑ Expansion of plants for HFC-based products in A5 countries and the HFC-based products population;
- ❑ Significant growth and introduction of high-GWP alternatives to replace HCFCs affecting servicing tail;
- ❑ RRR System that is sustainable and ready to cope with the challenges;
- ❑ Costs – Proprietary technologies;
- ❑ Training to deal with those alternatives.



## ***Private Sector can ...***

- ❑ Introduce and promote HCFC alternatives with significantly inferior GWP values than HCFC and with high energy efficiency, urgently!
- ❑ Support R&D for new, better, more sustainable and safer molecules to replace the HCFCs, and also the components optimization( compressors).
- ❑ To cooperate with the Government, Montreal Protocol Technical Panels and Implementing Agencies in the dissemination of those new technologies.
- ❑ Technical Trainings to absorb the future impacts of industrial conversion (highly flammable or mildly flammable alternatives).

## ***Governments can...***

- ❑ Support the development of new HCFC alternatives;
- ❑ Promote the adoption of low GWP alternatives;
- ❑ Develop policies that secure conditions of equality to avoid market distortions;
- ❑ Assure the participation of the private sector in the formulation of policies and regulations;
- ❑ Support regulations with clear goals that take into consideration GWP and energy efficiency criteria;



# *UNDP Presence in LAC Region*



## ***UNDP is doing...***

- ❑ Strengthening Regional and Country Teams to give support to A-5 countries;
- ❑ Increasing A-5 access to expertise in all key sectors;
- ❑ Supporting the dissemination of information about lower GWP alternatives;
- ❑ Implementing Pilot and Demonstration Projects to assess recently developed technologies that bring climate benefits using multilateral and bilateral financing;



## ***UNDP is doing( cont)...***

- ❑ Identifying and mobilizing multilateral and bilateral finance and co-finance from multiple sources to support A-5 countries;
  - ❑ NEX/NIM or DEX/DIM Modalities
  
- ❑ Adopting new modalities of project implementation to have faster delivery to meet 2015 obligations:
  - ❑ Centralized/decentralized activities
  - ❑ Performance Based Contracts and Letters of Agreements
  - ❑ Auditing and *in situ* verifications to ensure reductions were met;
  - ❑ Project Steering Committees to guarantee activities are being implemented in a sound way with local support from all stakeholders (equality and transparency).



**THANK YOU!**

**Comments, suggestions and questions are welcome!**

<http://www.undp.org/chemicals/montrealprotocol.htm>

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