LET'S BE REAL ABOUT HFCs: OPPORTUNITIES TO DO THE RIGHT THING

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HFC ASSESSMENT SHARPENING REPORT

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BUILDS ON EARLIER FINDINGS

- IGSD Primer on Hydrofluorocarbons
- Chatham House Research Paper on Fair and Effective Ozone and Climate Policies
- TEAP Reports on Technology and Replenishment
- Government Technology Assessments from Australia, Denmark, European Union, the United States and Others
- Public documents and wisdom of the MLF and Implementing Agencies
- Latest information from industry associations, companies, and environmental NGOs

CHATHAM HOUSE: NECESSARY NEXT STEPS

- ✓ Immediate financing of integrated HCFC phase-out and HFC phase-down management plans

- ✓ Essential-use exemptions or other flexibility to avoid high-GWP HFCs
- ✓ Demonstration projects to confirm cost and performance of alternatives to high-GWP

- ✓ New MLF guidelines to restore the original philosophy of full financing of incremental costs
- ✓ Commitment by non-A5 Parties to adequate replenishment to accomplish the simultaneous HCFC phase-out, HFC phase-down and energy efficiency

EUROPEAN UNION SECTOR TIMELINES

Sectors	Timelines
Household refrigerators and freezers	2015: GWP <150
Motor vehicle air conditioning	2017: GWP <150
Convenience technical aerosol products	2018: GWP <150
Extruded polystyrene	2020: GWP <150
Stationary commercial refrigeration	2020: GWP <2500 2022: GWP <150
Room air conditioning	2025: GWP <750
Foam products	2025: GWP <150

Exemptions for some foam, medical, and technical aerosol products

UNIQUENESS OF THIS REPORT

- ✓ Sharpens the assessment of available, energy efficient technology, using low-GWP solutions
- ✓ Mindful of cost effectiveness, safety, environmental and technical performance, including at high ambient temperatures
- ✓ Stresses importance of governments in removing barriers and putting in place appropriate safety standards
- ✓ Pragmatically considers financing opportunities
- ✓ Web based and periodically updated with latest information

DO THE RIGHT THING: MOTOR VEHICLE A/C

- ✓ MLF financed 1st transition from CFC-12 for A5, when HFC-134a was the global choice
- ✓ Available choice for 2nd transition from HFC- 134a is HFO-1234yf; future may include HFC-152a, CO_2 and HFO blends

- ✓ MLF could be important player in financing service tools and training for containment, recovery and reclamation of HFC-134a

- ✓ A5 Parties may require funding to defray the added cost of servicing MACS with HFO-1234yf, which is considerably more expensive than HFC-134a refrigerant

DO THE RIGHT THING: ROOM A/C

Non-A5 Parties made 1st transition to HFC-410A and now plan a 2nd transition

China, India, Indonesia and other pioneering A5 Parties are already leapfrogging HFC-410A

A single transition avoids wasted investment in training, service and other infrastructure

HC-290 and HFC-32 alternatives to HFC-410A are more energy-efficient

A5 Parties need to set standards and train technicians for flammable solutions

DO THE RIGHT THING: SMALL DOMESTIC AND COMMERCIAL REFRIGERATORS AND FREEZERS

A5 and Non-A5 Parties that had switched from CFC-12 to HFC-134a are transitioning…

The next generation choices are natural refrigerants and blends, CO_2, and emerging low-GWP fluorocarbons and blends

DO THE RIGHT THING: COMMERCIAL A/C

HFC-32/HFO blends with 2L flammability are more energy-efficient than HFC-410A (field trials)

HFO-1234yf with 2L flammability is less energy-efficient than HFC-134a (field trials)

HFO1234ze with 2L flammability is as efficient as HFC-134a (available in some markets)

HFO-1233zd is non-flammable, less efficient than HCFC-123 (available in some markets)

HFO-1336mzz is non-flammable, less energy-efficient than HCFC-123 (field trials)

DO THE RIGHT THING: INDUSTRIAL AND COMMERCIAL REFRIGERATION

Pioneering A5 and Non-A5 Parties and environmental leadership companies are transitioning from high-GWP HFCs to ammonia, hydrocarbons and CO_2

Over 30 HFC/HFO and other blends are under examination by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI)

Global companies are testing lower-GWP fluorocarbons and blends, and hybrid commercial refrigeration

DO THE RIGHT THING: FOAM

Companies worldwide are transitioning to hydrocarbons (pentanes, isobutane), methyl formate, methylal, CO_2, HFOs and other low-GWP fluorocarbons and blends

Most MLF-funded-Stage I conversions and demonstration projects for A5 Parties already transitioning to those low-GWP alternatives, some still under final implementation

CLEAR CHOICES EXIST…

Ready Now!

- Residential refrigerators and freezers
- Commercial beverage coolers and food freezers
- Commercial refrigeration by large supermarkets
- HC, CO_2, HFO, MF and methylal foam
- MAC training, tools and service infrastructure

UNIQUE OPPORTUNITIES FOR A5 PARTIES

A5 Parties not manufacturing HFC products

Can import next-generation technology as fast as alternative products are available from any global source

Can concentrate on capacity building, regulatory actions, technician training and service infrastructure

Can avoid dumping of high-GWP HFC products with environmental trade barriers, prior informed consent and tax incentives

The vast majority of A5 Parties DO NOT manufacture HFC products

A5 PARTIES CAN BE AT THE FOREFRONT

New pragmatic standards and enforcement are necessary for the safe use of flammable refrigerants and foam blowing agents

Training, regulations, enforcement, and professional discipline are essential

NOUs will require and welcome additional financing for capacity building in energy efficiency, networking and coordinating with industry and suppliers of the next new technology

DO IT SAFELY AND EFFICIENTLY

Safe use of flammable substances

- **New manufacturing, installation, transport and service standards**
- **Capacity building and technician training**
- **Proper care at end of appliance useful life**

DO IT SAFELY AND EFFICIENTLY

Like-minded Parties can join together to agree energy-efficiency criteria for refrigeration and A/C

Additional finance can guarantee super-energy-efficiency

OPPORTUNITIES FOR MLF FLEXIBILITY IN FINANCING

Pay the actual costs of transition, particularly for small- and medium-sized enterprises (SMEs)

Include financing for safety and energy efficiency standards & enforcement

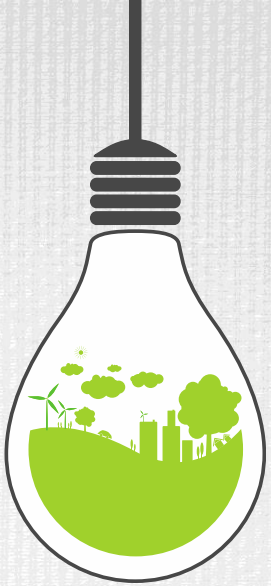
JUST DO IT!

The Montreal Protocol is ready and able with all the necessary support institutions in place to support A5 Parties

Pioneer companies have already replaced high-GWP HFCs in both A5 and Non-A5 countries for manufacture of most refrigeration, air conditioning and foam products

Energy Efficiency can be dramatically increased when high-GWP HFCs are phased down at the same time HCFCs are phased out in order to protect the climate, improve local air quality, reduce new power-plant investment, and make appliance ownership more affordable

CORRECTIONS, ELABORATIONS, AND DESCRIPTION OF NEW OPTIONS WELCOME



This Report is Web-based and will be periodically updated with the latest technical information

Spotlighted next-generation technology can be linked to case studies, SNAP listing, and other indications of market acceptance and penetration

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