



THE ALLIANCE
for Responsible Atmospheric Policy

AN INDUSTRY COALITION AND LEADING VOICE FOR
OZONE PROTECTION AND CLIMATE CHANGE POLICY



US INDUSTRY LEADERSHIP IN SUPPORT OF A GLOBAL HFC PHASEDOWN

Working Group Session on Fluorinated Gases
Technical Expert Meeting on Action on Non-CO₂ Greenhouse Gases
Bonn
October 22, 2014

What Has Been Driving The Change Up to This Point?

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- Regional and sub-regional HFC policies have flourished creating a patchwork of market conditions
- Bilateral and multilateral high-level statements in support of an HFC amendment to the Montreal Protocol have increased
- Industry has already begun to adapt as seen with the transition in the global mobile AC, commercial refrigeration and appliances away from R-134a
- Industry is working aggressively in all sectors

The complexities of an HFC phasedown require a unified, global approach

Dramatic Progress in the Last Year on New Low GWP Solutions

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• Refrigerants

- Mobile AC: Use of and interest in HFO-1234yf and HFO/HFC blends increasing rapidly
 - 2 million vehicles with HFO-1234yf by the end of 2014, compared to less than 500k by end of 2013
- Chillers: Use of HFO-1234ze, HFO-1233zd now commercially available, HFO-1336mzz expected to be available by the end of 2014
- Commercial refrigeration: Significant activities with HFOs in non-fluorinated alternatives
- Testing shows promising lower GWP solutions with better high ambient performance than HFC-410A

• Foams

- Polyurethane: HFO-1233zd commercially available, HFO-1336mzz expected to be available by the end of 2014
- Extruded Polystyrene: HFO-1234ze commercially available

• Solvents & Aerosols

- Several major companies offering low GWP solvents
- HFO-1234ze commercially available for many aerosol uses

• R&D

- Testing and studies show high ambient conditions are surmountable in cooling applications
- AREP (industry next gen refrigerant testing) phase 1 complete, and phase 2 is underway; implementation may require several years beyond testing completion
- Most HFOs found to have GWP < 1

Global policy certainty and consistency will encourage rapid development and adoption

How Can We Achieve an 80% Reduction?

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- Two large industries that use HFCs have already implemented ultra low GWP alternatives
 - Mobile AC
 - Foam blowing industry
- Appliance industry will use hydrocarbon and HFO solutions
- HVAC&R industry will employ a variety of solutions
 - HFO (GWP < 1) and HFO/HFC (GWP = 4-700) for most new equipment and retrofit/service
 - HFCs in special applications
 - Non-fluorinated solutions when appropriate
- Fire suppression, MDI and some technical aerosol applications need to use HFCs for critical uses
- Proper refrigerant management is critical for all refrigerant technologies

New technology continues to be developed and commercialized

How Do We Achieve More Progress?

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- Consistent and flexible policy with a global approach
- Progress on safety codes and standards
 - Agreement on flammability standards
 - Understanding on when non-flammable solutions are needed, and when mild flammability (2L) is possible
- Training and capacity building for safe handling of all refrigerants
- Understanding that HFCs are “useful” gases
 - Climate policies typically focus on “waste” chemicals like CO₂ and methane
 - Ozone protection policy has experience with transitioning to improved engineered chemicals
- Better education and implementation of refrigerant management policy
- Understanding that “low GWP” will vary by application
- Must be able to maintain and improve upon current efficiency standards

Collaboration among industry, NGOs and government is essential in order to succeed



- Significant development has already happened with fluorocarbons
- Refrigerant service supply over the life of the equipment
- Policy changes drive technology development
- Industry changes are complex, and need consistent and decisive global policy direction
- Significant HFC reduction is possible, but we need:
 - Flexibility in design and application
 - Ability to use higher GWP solutions when the application needs it
- Montreal Protocol institutions provide the best opportunity to achieve policy consistency