

The Global Refrigerant Transition: Good Science, Good Judgment, Correct Choices

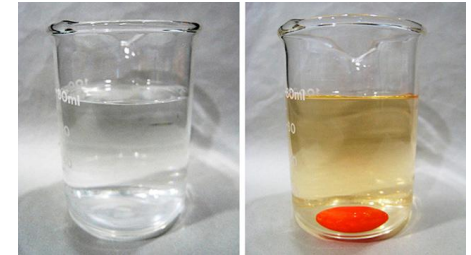
Stephen Yurek
President and CEO
Air-Conditioning, Heating, and Refrigeration Institute



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The global refrigerant picture is murky, but getting clearer

- **Research is continuing, but narrowing**
 - Solutions for some applications
- **New regulations are being enacted**
 - U.S. EPA Significant New Alternatives Program (SNAP)
 - F-gas regulation in Europe
- **Process to modify safety and building codes to allow the use of refrigerants that have flammable levels higher than current refrigerants has begun**
- **Training of technicians is vital and is being discussed**



Industry Is Not Waiting for Regulators

- **We know that we need to transition from high-GWP to lower-GWP refrigerants**
- **We are taking action**
- **Industry announced \$5 Billion R&D effort at White House last year**
- **Education and training must be key part of overall effort**



But We Must Get This Right: Refrigerants Are Vital

- **Used in air conditioning**
 - Vital for personal health, comfort, and well-being
- **Used in refrigeration**
 - Prolong life of perishable food
 - Keep life-saving medicines safe
- **Improve health, productivity, and safety**
- **Save lives**

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Challenges Ahead

- **There is no “magic” replacement for high GWP HFCs**
 - Choices and tradeoffs must be made
 - LCCP and not just GWP should drive decisions
- **U.S. National Institute of Standards and Technology**
 - Conducted comprehensive study of over **100,000,000** compounds to evaluate use as refrigerant
 - Found only **62** worth further consideration after screening for GWP, toxicity, flammability, stability and critical temperature
- **AHRI-led Low-GWP Research Program should help provide a clearer picture of suitable alternatives for each application**

Time is Still Needed



➤ **Commercial availability**

- Refrigerants
- Components (e.g., compressors, valves, electronics) that are compatible with new refrigerants

➤ **Research and Production**

- Time for equipment manufacturers to design and test equipment with new refrigerants and components
- Time to retool manufacturing lines to produce new equipment

➤ **Regulatory Approvals**

- Approval to use refrigerants in specific applications
- Updates to standards and national and local codes to address the use of A2L and A3 refrigerants

➤ **Training**

- Curricula and certifications need to be developed
- Technicians need to be trained on proper installation, maintenance, and handling of new technologies and refrigerants

Education and Training – A Major Global Challenge



Global Refrigerant Management Initiative

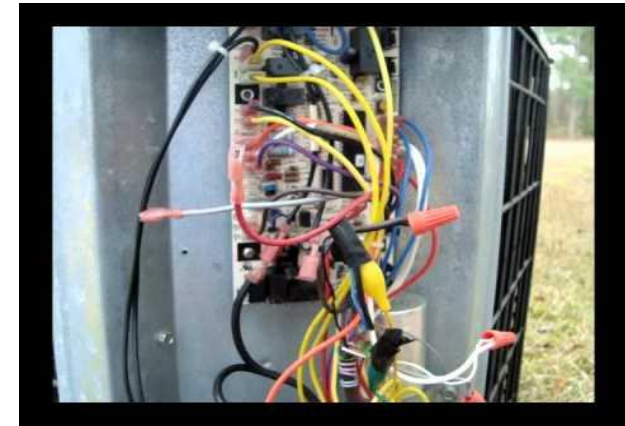
- **Launched in September 2014 by AHRI, the Alliance for Responsible Atmospheric Policy, and ABRAVA (Brazil)**
 - Participation by refrigerant organizations in Australia, Canada, China, Colombia, the EU, Japan, Mexico, and S. Korea
- **Objectives**
 - Build awareness
 - Develop best practices
 - Develop training and certification for technicians on proper management, servicing, and end-of-life practices



Proper Installation and Maintenance

- In addition to direct emission of the refrigerants, improper installation and lack of maintenance can result in a

40 percent loss of efficiency



Summary

- **We understand and accept the need to phase-down use of high GWP refrigerants**

- **Adequate time needed to:**
 - Properly research alternatives
 - Engineer products that can use alternatives safely and efficiently
 - Develop and implement education and training programs
 - Engage/educate government officials

- **We have a good record as an industry**
 - We must continue to work together to reduce emissions by making the right choices



Thank you!



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