

Energy & Store
Development Conference

E+SD

2015



EPA Update

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Scope of Presentation

- SNAP program's actions under the President's Climate Action Plan
 - Recent actions
 - Future considerations
- Anticipated updates to CAA Section 608 regulations on refrigerant management
- HCFC Phaseout
- Other HFC activities: federal procurement & international



Congratulations to this morning's award recipients!

Significant New Alternatives Policy (SNAP) Program



Evaluates alternatives & lists alternatives as:

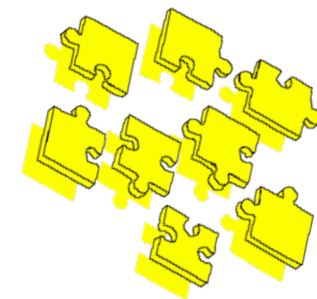
- **Acceptable** - those that reduce overall risk to human health & environment
- **Acceptable with use restrictions** - if needed to ensure safe use
- **Unacceptable**

Sectors include:

- Aerosols; Foams; Refrigeration and A/C; Solvents; Fire Suppression; Adhesives, Coatings, Inks, etc.

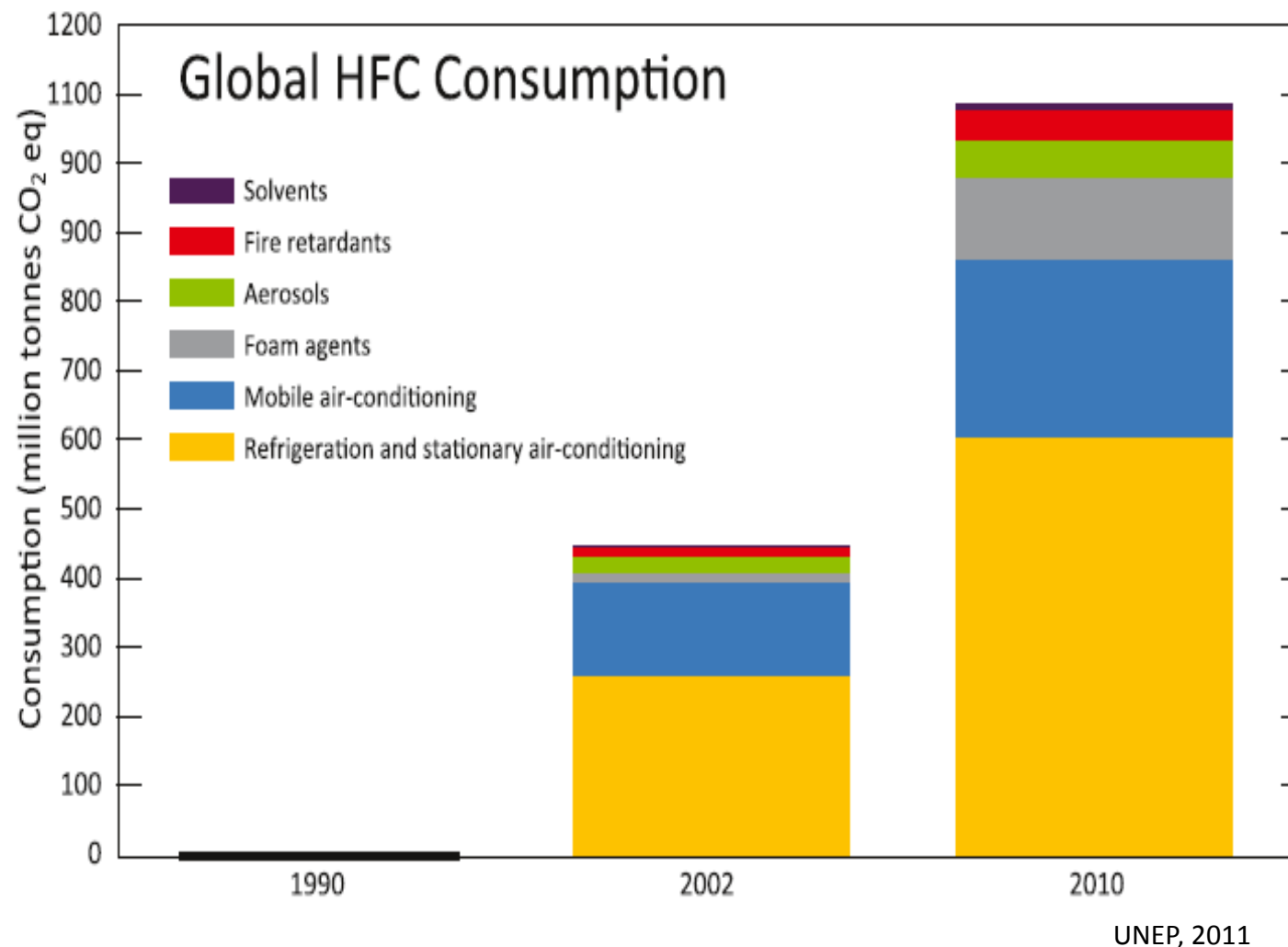
Considers:

- | | |
|-----------------------------|---|
| • Ozone-Depleting Potential | • Local Air Quality |
| • Global Warming Potential | • Ecosystem Effects |
| • Flammability | • Occupational & Consumer Health/Safety |
| • Toxicity | |



What are HFCs? Why are they a concern?

- HFCs are synthetic fluorinated greenhouse gases (GHGs)
- Use and emissions of HFCs are growing rapidly, because they are replacement for ozone-depleting substances (ODS) being phased out under the Montreal Protocol



HFCs are used in:

- Air-Conditioning (A/C)
- Refrigeration
- Foam Blowing
- Fire Suppression
- Aerosols
- Solvents



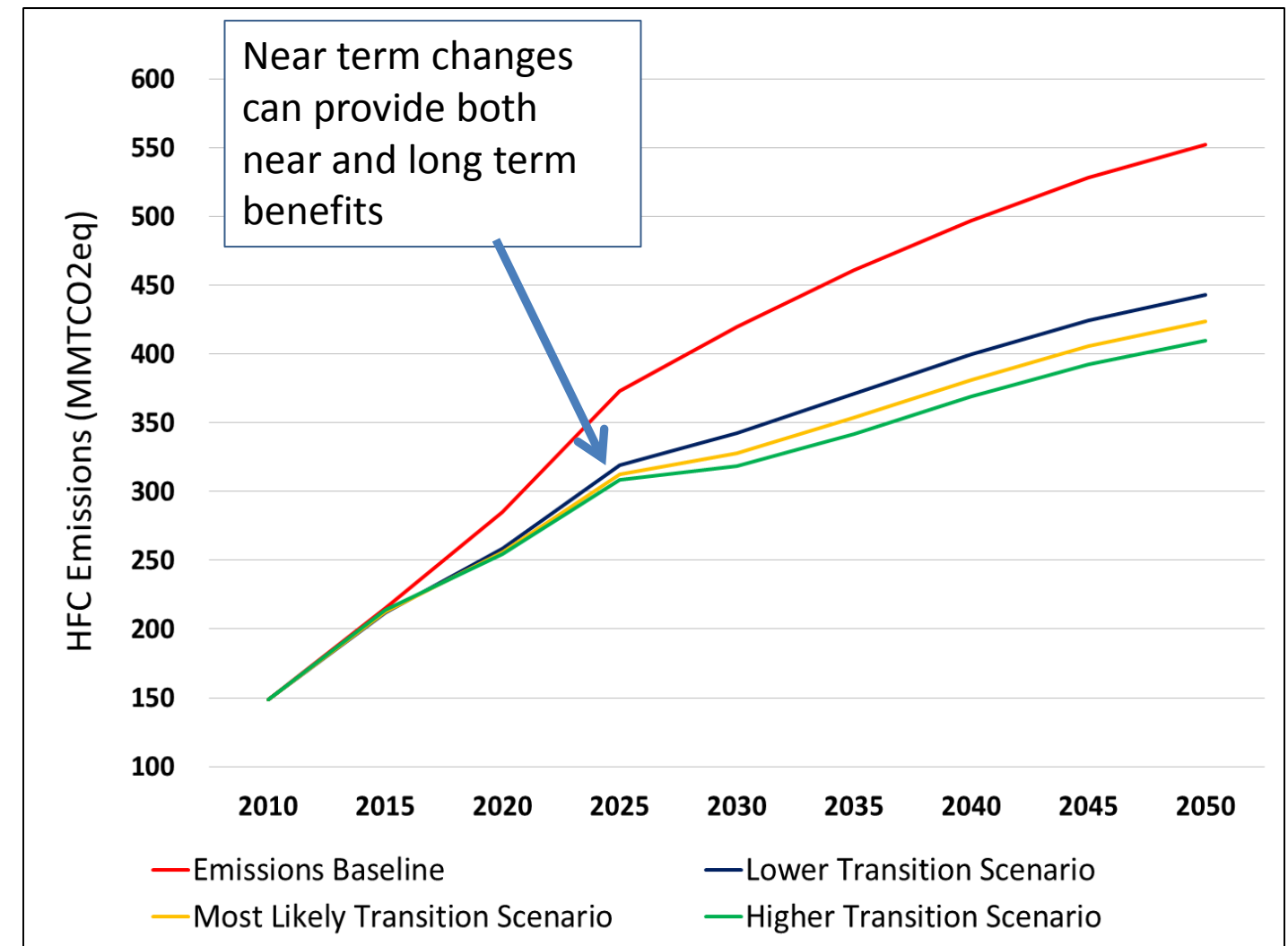
Some Key Principles Guiding Our Thinking

- SNAP rules will continue to consider individual end-uses
- No across the board GWP cut offs
- No prohibition on HFCs as a whole, or in any one sector
- New HFCs or HFC blends may be listed if risk not greater than other available substitutes
- Recognition that timing is a critical dimension and that each end use has unique considerations
- Status change actions will be issued through notice and comment rulemaking



Recent SNAP Actions

- Issued two acceptability notices adding alternatives
- Issued new rule adding five low-GWP flammable refrigerants with use conditions
- Published Status Change Rule prohibiting certain HFCs in certain end-uses
- HFC Emissions Reductions: 54-64 MMTCO₂eq in 2025





Acceptability Notices

October 2014

R-450A (HFC/HFO blend) RefAC

GWP: ~604 compared to HFC-134a: 1430

1233zd(E) heat transfer & flexible PU foams

GWP <7 compared to alternatives: 1070-4000

CO₂ refrigerated transport

GWP: 1 compared to alternatives: ~1400-4000

Methylal foam blowing end-uses

GWP <3 compared to alternatives: 725-1430

HFO-1336mzz(Z) foam blowing end-uses

GWP: ~9 compared to alternatives: 725-1430

Powdered Aerosol D fire suppression

GWP <25 compared to alternatives: 0-3500

July 2015

R-450A (HFC/HFO blend) RefAC

GWP: ~604 compared to HFC-134a: 1430

R-448A (HFC/HFO blend) RefAC

GWP: 1387 compared to R-404A: 3922

R-513A (HFC/HFO blend) RefAC

GWP: 630 compared to HFC-134a: 1430

R-449A (HFC/HFO blend) RefAC

GWP: 1397 compared to R-404A: 3922

HFO-1336mzz(Z) foam blowing end-uses

GWP: ~9 compared to HFC-245fa: 1030

MPHE RefAC, solvent cleaning aerosols and adhesives/coatings

GWP <3 compared to alternatives: 0-3500



2015 Low-GWP Refrigerants Rule

- Use conditions required to address flammability
- New equipment only

Refrigerant	GWP	End-Use and Application*					
		Household Refrigerators	Retail refrigerator stand-alone	Vending	Very Low Temp Ref	Heat Transfer	Room AC-Self-contained
Ethane	6				✓	✓	
Isobutane	8		✓	✓			
Propane	3	✓		✓			✓
R-441A (HC blend)	<5		✓	✓			✓
HFC-32	675						✓

* End-uses are in addition to those previously listed by EPA, including those listed in 2011



July 2015: Change of Status Rule

Aerosols

- HFC-125 - January 2016
- HFC-227ea & blends - July 20, 2016
- HFC-134a - July 20, 2016/January 1, 2018

Motor Vehicle Air Conditioning

- HFC-134a in New Light-Duty Systems - MY 2021
- HCFC & HFC Containing Blends in New Light-Duty Systems - MY 2017

Retail Food Refrigeration & Vending Machines

- New Supermarket Systems - January 2017
- New Remote Condensing Units - January 2018
- New Vending Machines - January 2019
- New Stand-Alone Units (small medium-temp, large medium-temp, low-temp)- January 2019/January 2020
- Retrofitted Retail Food Refrig Equipment and Vending Machines - July 20, 2016

Foams

- All End-Uses, Except Rigid PU Spray Foam- Various dates between January 2017-January 2021



July 2015 Change of Status Rule: Retail Food and Vending

- Proposed Jan. 1, 2016 change of status for retail food refrigeration and vending machines
- Differentiated dates by end-uses in final rule in response to comments
 - Supermarket systems: Jan. 1, 2017
 - Remote condensing units: Jan. 1, 2018
 - Stand-alone units
 - Medium-temperature: Jan. 1, 2019
 - Low-temperature: Jan. 1, 2020
 - Vending machines: Jan. 1, 2019
 - Retrofits: one year from publication, July 20, 2016
- Also, expanded list of alternatives in Low-GWP Refrigerants Rule, Notice 29 & Notice 30



July 2015 Change of Status Rule

End Use	Change of Status Date
Retail Food Refrigeration	
New Supermarket Systems	January 1, 2017
New Remote Condensing Units	January 1, 2018
<ul style="list-style-type: none">• New Stand-Alone Small Medium-Temperature Units• Large Medium Temperature Units• Low-Temperature Units	January 1, 2019/January 1, 2020
Retrofitted Covered Retail Food Refrig. Equipment	July 20, 2016
Vending Machines	
New Vending Machines	January 1, 2019
Retrofit Vending Machines	July 20, 2016
Commercial Refrigeration Foam	
Rigid Polyurethane Commercial Refrigeration and Sandwich Panels	January 1, 2020



Sept. 11 Stakeholder Meeting

EPA is considering a future proposed rule that **could include:**

- Listing of acceptable alternatives with use conditions
 - Use conditions would mitigate risks, e.g., flammability, exposure limits
- Listing of unacceptable alternatives
 - Where risks cannot be mitigated sufficiently, e.g., flammability, toxicity, air quality impacts, climate
- Change of listing status from acceptable to unacceptable
 - EPA thinking potentially later transition dates than in July 20th final rule
 - End-uses based on stakeholder comments and EPA analysis
 - Refrigeration and A/C: e.g., chillers, refrigerated food processing and dispensing, household refrigerators and freezers, cold storage warehouse
 - Rigid PU spray foam; fire suppression



Next Steps

- Continue to expand SNAP acceptable list
 - Additional alternatives under evaluation
 - Additional end-uses are being evaluated
- Continue to work with stakeholders
 - GreenChill webinar October 6
 - Food Cold Chain Workshop in Montreal (November)
- Develop next SNAP Notice for acceptable listings
- Develop next SNAP Rule to include alternatives that are:
 - Acceptable with use conditions
 - Unacceptable
 - Change of status

Clean Air Act Section 608 Update

National Recycling and Emission
Reduction Program

CAA Section 608 Regulations

- Purpose: Reduce emissions of ODS and substitute refrigerants during service, maintenance, repair and disposal of appliances
- Requirements to date:
 - Prohibition against knowingly venting refrigerant (all refrigerants except those exempt)
 - Leak repair and prevention for larger systems (for CFCs, HCFCs)
 - Service practice requirements (for CFCs, HCFCs)
 - Safe disposal requirements (for CFCs, HCFCs)

CAA Section 608: Update to Refrigerant Management Requirements

- Fall 2014 EPA announced plans to update refrigerant management regulations considering goals:
 - Reduce emissions of high-GWP refrigerants by expanding regulations to fully include HFCs
 - Simplify, clarify, and improve existing requirements
- Since then, EPA has engaged with stakeholders on needed changes, heard many great ideas
- Draft proposal under interagency review

Next Steps

- Propose rule in late 2015
- Public comment period
- Final rule in 2016 after considering public comment

HCFC Allocation Program

HCFC Phaseout

- HCFC Phaseout creates additional incentive for responsible handling, recovery and reclamation
- October 2014: final 2015-2019 allocation is approximately 75% below total allowed under Montreal Protocol
 - 2016 allocation for R-22 is approximately 20% below 2015 allocation
- Jan. 1, 2020: No production or import of R-22
 - Used, recovered and recycled material may still be used for servicing
 - Virgin material imported or produced before Jan. 1, 2020 may still be used for servicing until 2030
- Protects human health and the environment, while encouraging transition to non-ODS alternatives and greater recycling of existing HCFCs

Other HFC Activities

- Federal Procurement
- International Efforts

HFCs: Federal Procurement

- Provide federal leadership by purchasing “cleaner alternatives to HFCs whenever feasible and transition over time to equipment that uses safer and more sustainable alternatives”
- Proposed rule addressing HFCs by amending Federal Acquisition Regulation directing the government to procure alternatives to high-GWP HFCs, where feasible
 - Use acceptable alternatives identified by SNAP program
 - Reporting on use of HFCs (i.e., refrigerants)
 - Final rule expected in 2015
- Case Study: Lackland Air Force Base Commissary
 - Transitioned from R-404A DX system to an ammonia/CO₂ cascade system



HFCs: International Activities

- U.S. pursuing HFC Amendment to the Montreal Protocol
 - Four amendment proposals submitted this year
 - Canada, Mexico and the United States; European Union; India; and a Group of Island States
 - Phase DOWN, not OUT
 - For consideration at the Meeting of the Parties Nov. 2015
- Climate and Clean Air Coalition (CCAC)
 - Projects approved in Jordan and Chile to demonstrate emerging low-GWP technologies in supermarket refrigeration systems

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608 Update & HCFC Phaseout

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Thank you!

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