

Impact of the AIM Act on DoD

Pete Mullenhard
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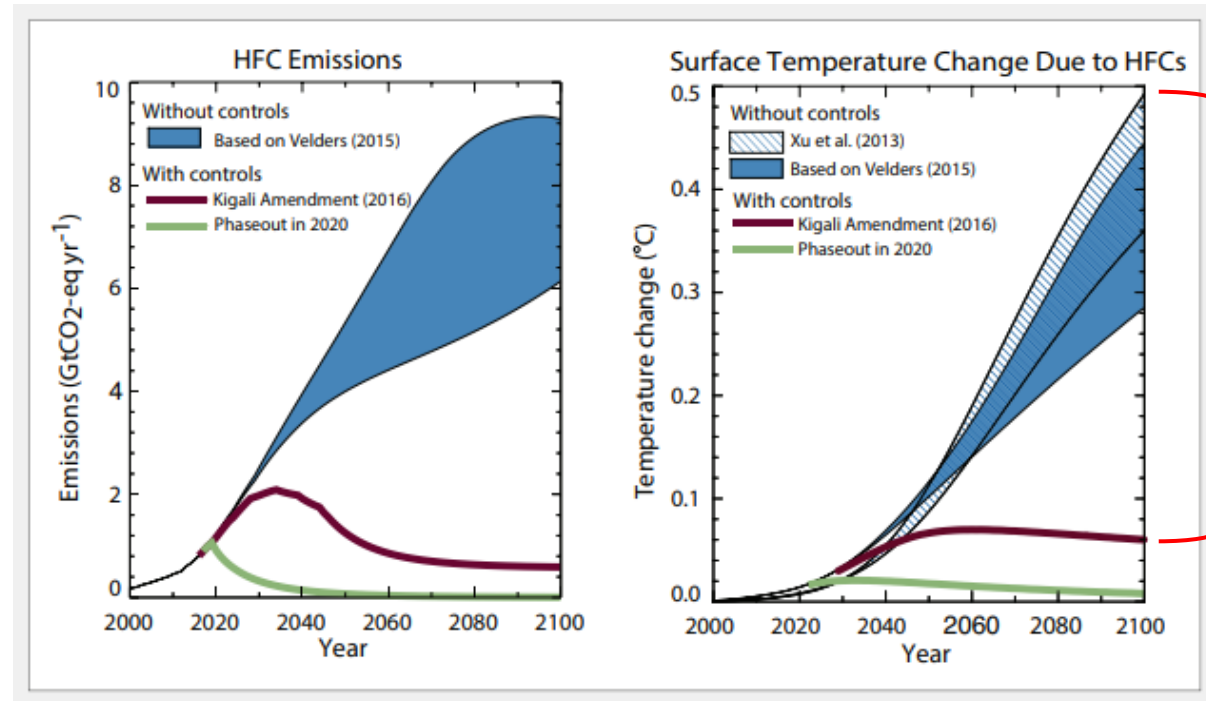
Background: Global Phasedown of HFCs

- **Hydrofluorocarbons (HFCs)**

- Replacements for Ozone-Depleting Substances (ODS)
- Used as refrigerants, fire suppressants, foam blowing agents, solvents, etc.
- Potent greenhouse gases with Global Warming Potentials (GWP) hundreds to thousands of times higher than CO₂
- Absent regulation, use expected to rapidly increase globally

- **Montreal Protocol Kigali Amendment**

- Passed 15 October 2016
- Went into force 1 January 2019
- 128 parties have ratified to date
- US has not yet ratified
- Step-wise HFC phasedown to 15% of baseline by 2036 (GWP-weighted)

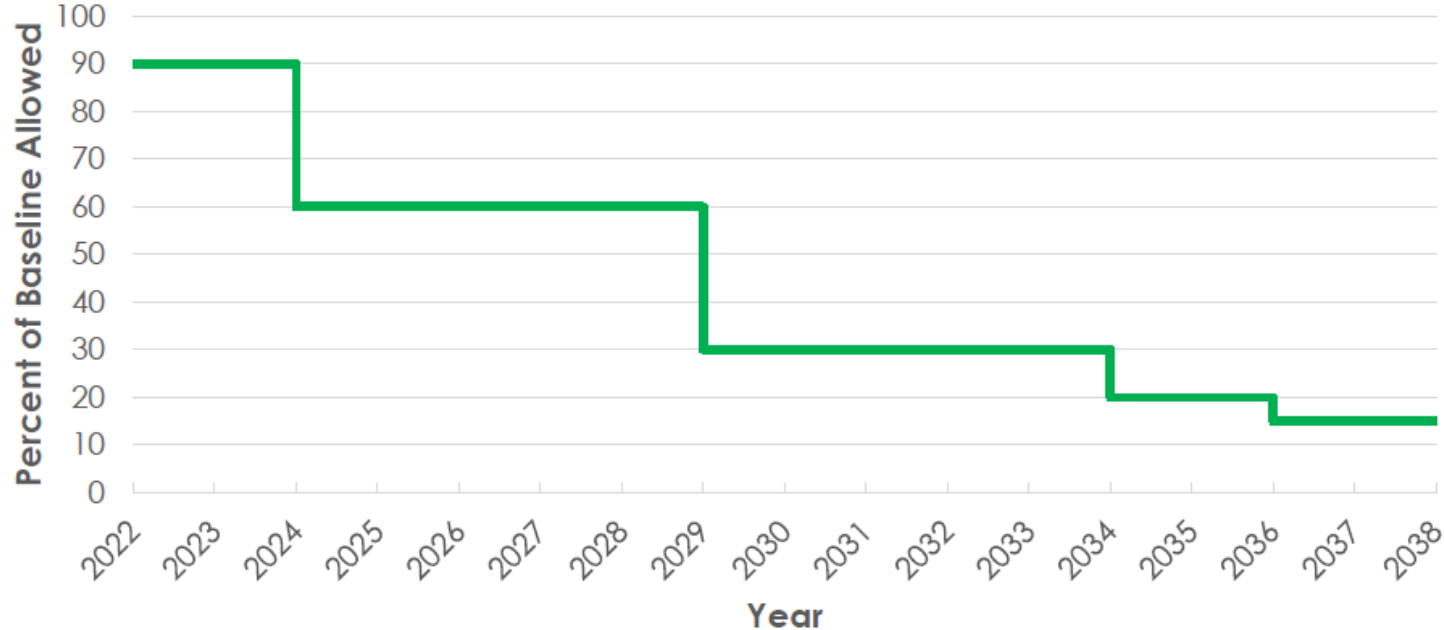


WMO 2018 Executive Summary: Scientific Assessment of Ozone Depletion

Background: AIM Act (US HFC phase down)

- **American Innovation and Manufacturing (AIM) Act**

- Signed into law on 27 December 2020
- Phases down Hydrofluorocarbon (HFC) production to 15% of baseline by 2036 (same schedule as Kigali Amendment)
- Baseline and phase down steps are HFC Exchange Value-weighted (Exchange Values are equivalent to GWP)



Background: AIM Act (cont'd)

- **Prioritizes Mission-Critical Military End Uses (MCMEU) over other HFC uses by allocating production/import allowances directly to DoD**
 - Other essential uses being prioritized include Metered Dose Inhalers (MDI), Defense Sprays (pepper sprays), semiconductors, structural composite preformed polyurethane foams, and onboard aviation fire suppression
 - States pre-empted from enforcing state HFC regulations against essential uses for 5-years (EPA may exempt for an additional 5-years)
- **EPA authorized to issue new regulations to:**
 - Facilitate sector-based transition to next generation technologies (lower exchange value or non-HFC)
 - Manage HFCs and substitutes
 - Phase down HFCs through an allowance allocation program

How are HFC allowances being distributed?

- **EPA issued CY 2022 allowances on 1 October 2021**
- **Application-specific allowances (including MCMEU) taken off the top (2% of allowances)**
 - Allowances may be used directly to import HFCs or can be conferred to a producer or importer
 - Company producing or importing HFCs must have allowances “in-hand” prior to producing or importing
 - DoD received all MCMEU allowances (0.8% of allowances)
- **Set-Aside allowances (2.7% of allowances)**
 - New market entrants, small importers and companies identified too late during initial distribution of application-specific allowances
 - MCMEU do not qualify for set-asides (DoD already received allowances on 1 October 2021)
 - Distributed on 31 March 2022, unused portion to be allocated to companies that produced or imported HFCs in 2020
- **Remaining 95+% of allowances distributed to the open market (HFC producers and importers)**
 - Unlikely to see any immediate impacts to most of the market in 2022-2023 except rising prices

Must I have allowances to purchase HFCs for military uses?

- **MCMEU and other application-specific users are not required to use allowances**
 - If desired, users can continue to purchase from the open market
- **As market tightens in 2024 and beyond from subsequent phase down steps, allowances may be necessary**
 - Having allowances does not guarantee industry will continue to produce/import specific HFCs
 - Highest EV HFCs likely present the highest risk to the supply chain (R-404A, R-507, HFC-236fa, etc.)
 - Industry could choose to close domestic production plants and import material from offshore plants
 - The PRC is the most likely source for offshore supply
 - Offshore supply presents additional supply chain risk to DoD

What are mission-critical military end uses?

- **MCMEU Definitions**

- **AIM Act:** Uses such as armored vehicle engine and shipboard fire suppression systems and systems used in deployable and expeditionary applications
- **EPA HFC allowance allocation regulation implementing the AIM Act:** Uses of regulated substances by an agency of the Federal Government responsible for national defense that have a direct impact on mission capability, **as determined by the U.S. Department of Defense**, including, but not limited to uses necessary for development, testing, production, training, operation, and maintenance of Armed Forces vessels, aircraft, space systems, ground vehicles, amphibious vehicles, deployable/expeditionary support equipment, munitions, and command and control systems

- **Does not include the vast majority of HFC uses by facilities**

- **Includes uses by defense industrial base contractors as determined by DoD**

- Production, testing, and maintenance of mission-critical equipment
- FMS
- DCS

- **Includes military uses by other federal agencies for national defense as determined by DoD**

- DHS/Coast Guard, DOE/NNSA, etc.

How do I get MCMEU allowances?

- **DoD will be issuing further policy and procedures to request, track, and report MCMEU allowances**
 - A DoD working group has been formed to develop procedures
 - CY 2022 allowances were distributed by EPA based on DoD-developed estimates
 - Future years will include data calls
 - DoD Components will be reviewing requests and making determinations whether a use is deemed mission-critical
 - Data will be used by DoD to request allowances for the next calendar year from EPA
 - Contractual actions will likely be required to confer allowances to defense industrial base contractors
- **Uses by non-DoD federal agencies will be handled by MOUs**
- **Use of MCMEU allowances will require significant recordkeeping tracking, and reporting**
 - Reports to EPA
 - 31 January and 31 July
 - 31 July report includes request for next calendar year allowances and description of plans to transition to alternatives
 - Annual DoD “monitoring and review” report (31 May of the year following the compliance period)

Industry Response

- **Transition to New Technologies**

- **Non-HFC alternatives**

- Hydrofluoroolefins (HFO) – most are mildly flammable
 - “Natural” refrigerants – CO₂, hydrocarbons, ammonia
 - Fire suppressants (Fluoroketones, 2-BTP, water mist, inert gas, etc.)

- **Lower Exchange Value alternatives**

- HFO/HFC blends
 - Lower-EV HFC (example: HFC-32 = 675 EV)

- **Example transitions to alternatives**

- Motor vehicle AC: HFC-134a (EV 1,430) → HFO-1234yf (EV 0) = 100% reduction
 - Residential/Light Commercial AC: R-410A (EV 2,088) → R-454B (EV 465) = 77.7% reduction
 - Household refrigerators: HFC-134a (EV 1,430) → Hydrocarbons (EV = 0) = 100% reduction
 - Building chillers (new design): HFC-134a (EV 1,430) → HFO-1234ze (EV 0) = 100% reduction
 - Building chillers (existing design): HFC-134a (EV 1,430) → R-513A (EV 629) = 56% reduction

Military Requirements & Risks

- **Extreme Operating Conditions**

- Desert to Arctic, High Altitude, Undersea, etc.

- **Combat**

- Military threats - enhance flammability of refrigerants, require rapid fire extinguishment to protect crew
- Personnel may be unable to exit vehicles in emergencies (exposure to chemical and its combustion by-products)

- **Unique Requirements**

- Compatibility with life support systems
- Confined spaces
- Weight and volume limitations
- Acoustic signatures of equipment

- **Risk Assessments**

- Assessments conducted for commercial applications may not be adequate for military applications
- Assessment of military-unique risks may be required
- Mitigation of risks may not be possible in some cases
- May require use of nonflammable alternatives (many still contain HFCs)
 - HFC-134a (EV 1,430) → R-513A (EV 629), R-515B (EV 287), etc.
 - R-410A (EV 2,088) → R-466A (EV 0)
 - R-404A (EV 3,922) → R-448A (EV 1,386), R-449A (EV 1,396), etc.



Questions?