Maryland
Department of the Environment

Prohibition of Hydrofluorocarbons (HFCs) in Certain End-Uses

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Air Quality Control Advisory Council
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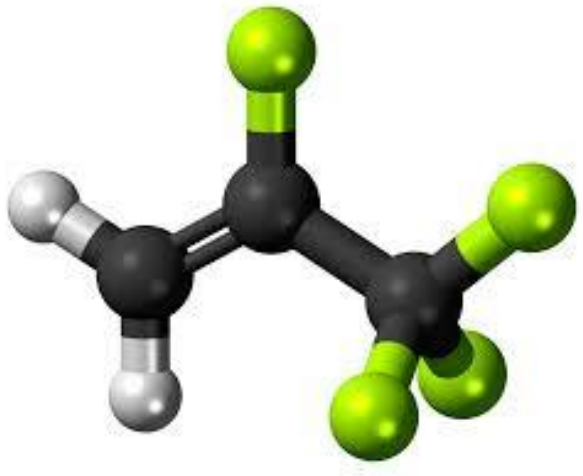
Overview

- Federal Program
  - Legal Challenges
  - State Action
- Proposed Regulation
- Timeline
- Questions/Discussions




DELAYS WITH THE FEDERAL PROGRAM

Federal Program: EPA SNAP

- EPA established the Significant New Alternative Policy (SNAP) to identify and evaluate substitutes for ozone-depleting substances
- EPA's 2015 SNAP Rule 20 & 2016 SNAP Rule 21 prohibited high global warming potential (GWP) HFCs by end-use
- The EPA rules were challenged

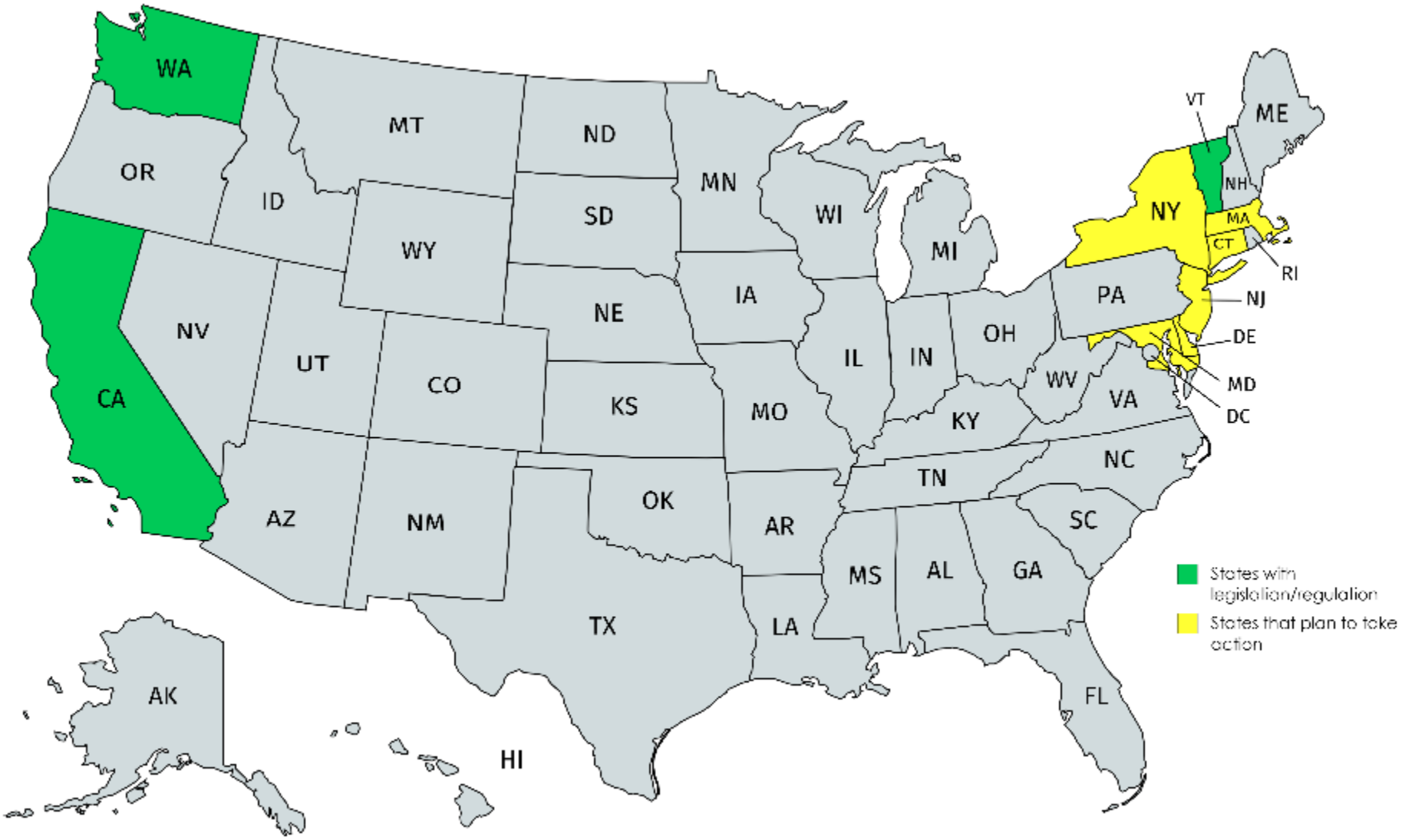
Mexichem Fluor vs. EPA

- In August 2017, the DC Circuit Court of Appeals vacated parts of the 2015 SNAP Rule (SNAP Rule 20) “to the extent it requires manufacturers to replace HFCs with a substitute substance”
  - DC Court of Appeals also vacated parts of the 2016 Rule (SNAP Rule 21)
- Rule remanded to EPA - a new EPA rulemaking has not yet occurred
- In 2018, EPA issued guidance stating that it will not be enforcing SNAP Rule 20 or 21 until it adopts new rules reflecting the Court’s decision. This has lead to uncertainty of compliance of both the 2015 and 2016 SNAP rules on the federal level.

States Initiate Action

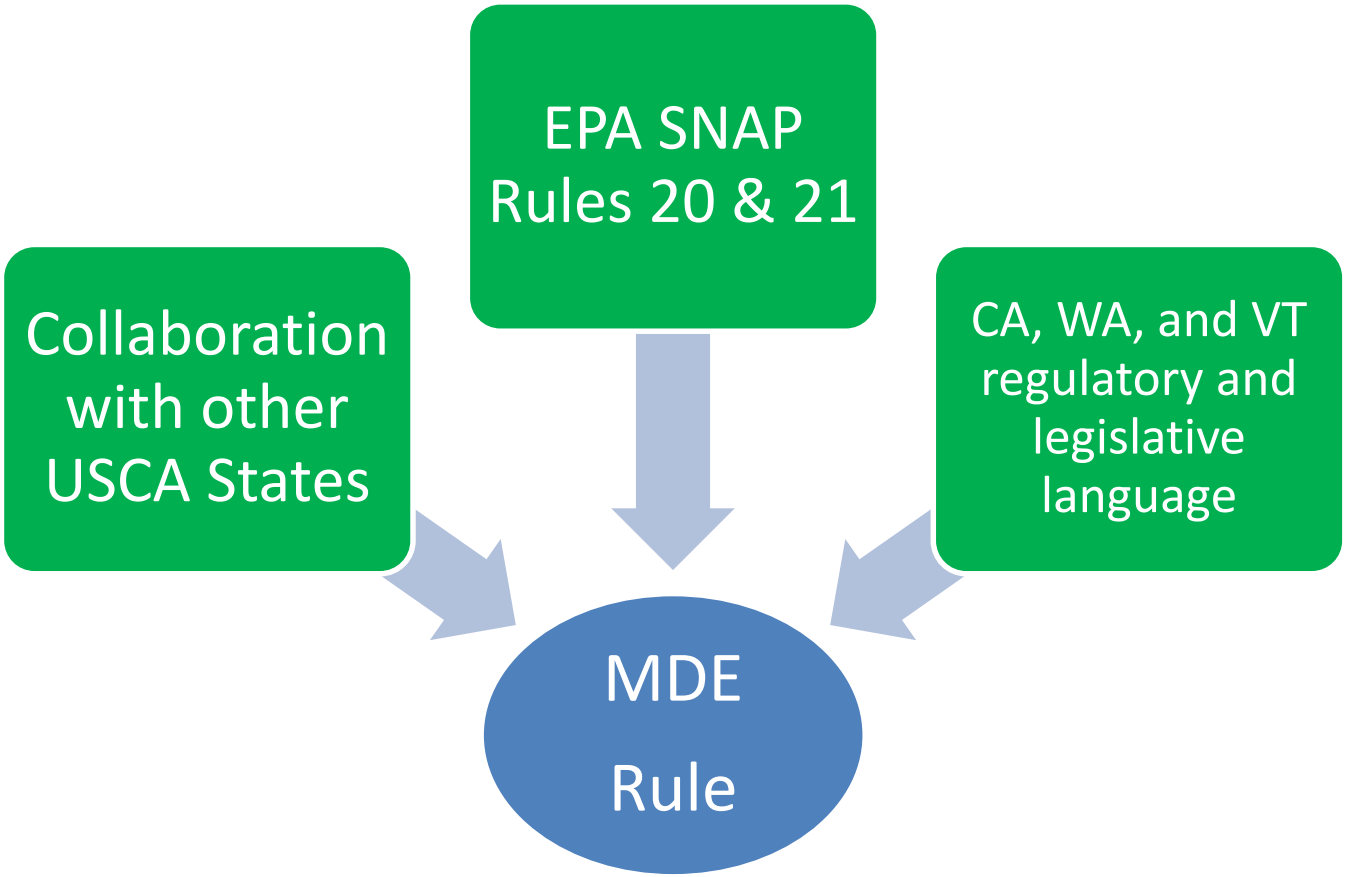
- In the face of stalled federal regulations and to provide regulatory certainty, Maryland and other US Climate Alliance (USCA) states are moving forward with state programs to prohibit the use of certain HFCs
- State programs will require affected sources to transition to widely available alternatives that are less harmful to the environment
- USCA and state efforts are strongly supported by much of the private sector involved in this issue and the environmental community

States Initiate Action, contd.




PROPOSED
REGULATION

Where Did Maryland's Regulatory Language Come From?



Same goal: Require the transition from high-GWP substances to widely available environmentally-friendly alternatives

Proposed Regulations
Major Sectors Affected

- Applies to any person who sells, offers for sale, installs, uses, or introduces into commerce in Maryland, any substance for use in an end-use listed in the regulation

Air Conditioning

- Centrifugal chillers (new)
- Positive displacement chillers (new)

Refrigeration

- Cold storage warehouses (new)
- Household refrigerators and freezers (new)

Foams

- Flexible Polyurethane
- Integral Skin Polyurethane

Aerosol

- Propellants

Proposed Regulation

Prohibited Substances and Effective Dates, Table Footnotes

1. Aligns end-use categories, substances, and dates with other USCA States and EPA SNAP Rules 20 and 21, where possible
2. HFC prohibitions only for those end-use categories explicitly stated

3. EPA alternatives: https://www.epa.gov/snap/snap-substitutes-sector

4. Products/equipment manufactured or acquired prior to the prohibition date can still be sold or used after the prohibition date.

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Prohibited Substance	Effective Date
AEROSOL PROPELLANTS		
Aerosol Propellants	HFC-125, HFC-134a, HFC-227ea and blends of HFC-227ea and HFC-134a	January 1, 2021

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Common application(s)	Prohibited Substance	Effective Date
AIR CONDITIONING			
Centrifugal chillers (new)	*Commercial comfort air conditioning*	FOR12A, FOR12B, HFC-134a, HFC-227ea, HFC-236fa, HFC245fa, R-125/ 134a/ 600a (28.1/70/1.9), R-125/ 290/ 134a/ 600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-410A, R-410B, R-417A, R-421A, R-422B, R-422C, R-422D, R-423A, R-424A, R-434A, R438A, R-507A, RS-44 (2003 composition), THR-03	January 1, 2024
Positive displacement chillers (new)	*Commercial comfort air conditioning*	FOR12A, FOR12B, HFC-134a, HFC-227ea, KDD6, R125/ 134a/ 600a (28.1/70/1.9), R-125/ 290/ 134a/ 600a (55.0/1.0/42.5/1.5), R-404A, R-407C, R-410A, R-410B, R-417A, R-421A, R-422B, R-422C, R-422D, R-424A, R-434A, R-437A, R438A, R-507A, RS-44 (2003 composition), SP34E, THR-03	January 1, 2024

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Prohibited Substance	Effective Date
REFRIGERATION		
Cold storage warehouses (new)	HFC-227ea, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R404A, R-407A, R-407B, R-410A, R-410B, R-417A, R-421A, R421B, R-422A, R-422B, R-422C, R-422D, R-423A, R-424A, R428A, R-434A, R-438A, R-507A, RS-44 (2003 composition)	January 1, 2023

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Prohibited Substance	Effective Date
REFRIGERATION		
Household refrigerators and freezers—compact (new)	HFC-227ea, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R404A, R-407A, R-407B, R-410A, R-410B, R-417A, R-421A, R421B, R-422A, R-422B, R-422C, R-422D, R-423A, R-424A, R428A, R-434A, R-438A, R-507A, RS-44 (2003 composition)	January 1, 2021
Household refrigerators and freezers (new)	Same as above	January 1, 2022
Household refrigerators and freezers—built in appliances (new)	Same as above	January 1, 2023

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Prohibited Substance	Effective Date
REFRIGERATION		
Supermarket Systems (Retrofit)	R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R428A, R-434A, R-507A	January 1, 2021
Supermarket Systems (New)	HFC-227ea, R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, R-507A	January 1, 2021

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Common application(s)	Prohibited Substance	Effective Date
REFRIGERATION			
Remote Condensing Units (Retrofit)	Refrigeration in convenience stores, bakeries, restaurants	R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R428A, R-434A, R-507A	January 1, 2021
Remote Condensing Units (New)	Same as above	HFC-227ea, R-404A, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, R-507A	January 1, 2021

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Prohibited Substance	Effective Date
REFRIGERATION		
Stand-Alone Units (Retrofit)	R-404A, R-507A	January 1, 2021
Stand-Alone Medium-Temperature Units (New)	FOR12A, FOR12B, HFC-134a, HFC-227ea, KDD6, R125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R407A, R-407B, R-407C, R-407F, R-410A, R-410B, R417A, R-421A, R-421B, R-422A, R-422B, R-422C, R422D, R-424A, R-426A, R-428A, R-434A, R-437A, R438A, R-507A, RS-24 (2002 formulation), RS-44 (2003 formulation), SP34E, THR-03	January 1, 2021
Stand-Alone Low-Temperature Units (New)	HFC-227ea, KDD6, R-125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R-407A, R-407B, R-407C, R-407F, R-410A, R-410B, R-417A, R-421A, R-421B, R422A, R-422B, R-422C, R-422D, R-424A, R-428A, R434A, R-437A, R-438A, R-507A, RS-44 (2003 formulation)	January 1, 2021

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Prohibited Substance	Effective Date
REFRIGERATION		
Refrigerated food processing and dispensing equipment (New)	HFC-227ea, KDD6, R-125/ 290/ 134a/ 600a (55.0/1.0/42.5/1.5), R-404A, R-407A, R-407B, R-407C, R-407F, R-410A, R-410B, R417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R424A, R-428A, R-434A, R-437A, R-438A, R-507A, RS-44 (2003 formulation)	January 1, 2021

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Prohibited Substance	Effective Date
REFRIGERATION		
Vending Machines (Retrofit)	R-404A, R-507A	January 1, 2021
Vending Machines (New)	FOR12A, FOR12B, HFC-134a, KDD6, R125/290/134a/600a (55.0/1.0/42.5/1.5), R-404A, R407C, R-410A, R-410B, R-417A, R-421A, R-422B, R422C, R-422D, R-426A, R-437A, R-438A, R-507A, RS-24 (2002 formulation), SP34E	January 1, 2022

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Common application(s)	Prohibited Substance	Effective Date
FOAM			
Flexible Polyurethane	Furniture, bedding, chair cushions	HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof	January 1, 2021
Integral Skin Polyurethane	Car steering wheels and dashboards	HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel Z-6	January 1, 2021
Polystyrene Extruded Sheet	Packaging and food-services items, take-out containers, food trays	HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel Z-6	January 1, 2021
Phenolic Insulation Board and Bunstock	Roofing and wall insulation	HFC-143a, HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof	January 1, 2021
Polyolefin	Foam sheets and tubes	HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel Z-6	January 1, 2021
Polystyrene Extruded Boardstock and Billet (XPS)**	Roofing, walls, flooring, and pipes	HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel B, Formacel Z-6	January 1, 2021*

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Common application(s)	Prohibited Substance	Effective Date
FOAM			
Rigid Polyurethane and Polyisocyanurate Laminated Boardstock	Roofing and wall insulation	HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof	January 1, 2021
Rigid Polyurethane Slabstock and Other	Insulation for panels; fabricated shapes for pipes	HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, Formacel Z-6	January 1, 2021
Rigid Polyurethane Appliance Foam	Insulation foam in residential refrigerators and freezers	HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, Formacel Z-6	January 1, 2021
Rigid Polyurethane Commercial Refrigeration and Sandwich Panels	Insulation in walls and doors, including for commercial refrigeration equipment and garage doors	HFC-134a, HFC-245fa, HFC-365mfc, and blends thereof; Formacel TI, Formacel Z-6	January 1, 2021
Rigid Polyurethane Marine Flotation Foam	Buoyancy or floatation foam used in boat and ship manufacturing	HFC-134a, HFC-245fa, HFC-365mfc and blends thereof; Formacel TI, Formacel Z-6	January 1, 2021

Proposed Regulation

Prohibited Substances and Effective Dates

End-Use	Common application(s)	Prohibited Substance	Effective Date
FOAM			
Rigid polyurethane (PU) high-pressure two-component spray foam	Applied in situ	HFC-134a, HFC-245fa, and blends thereof; blends of HFC365mfc with at least 4 percent HFC-245fa, and commercial blends of HFC-365mfc with 7 to 13 percent HFC-227ea and the remainder HFC-365mfc; Formacel TI	January 1, 2021*
Rigid PU low-pressure two-component spray foam**	Applied in situ	Same as above	January 1, 2021*
Rigid PU one-component foam sealants	Applied in situ	Same as above	January 1, 2021*

Proposed Regulation

Prohibited Substances and Effective Dates, Specific Stakeholder Requests

* Request from stakeholder to extend prohibition date for 4 foam end-uses to January 1, 2022

  – MDE is proposing to keep prohibition dates as is. The Department is staying consistent with USCA states.

** Request from stakeholder to allow listed HFC blends with a global warming potential less than 750 approved by EPA to be compliant with regulation

  – MDE plans to include in the technical support document that the Department will initiate proposed amendments should EPA approve a previously banned substance

Proposed Regulation
Disclosure Statement and Recordkeeping

- **Disclosure statement:** end-user/buyer guidance
  - Enforcement mechanism
  - Provide assurance to owners and manufacturers that compliant substances are being used in products and equipment
  - Worked extensively with each major industry sector to craft language that is not overly burdensome and leveraged pre-existing labeling
  - Maryland expects a disclosure provision to be common amongst USCA states over the next few years

- **Recordkeeping:** information required on-site for 5 years

Proposed Regulation

Reporting

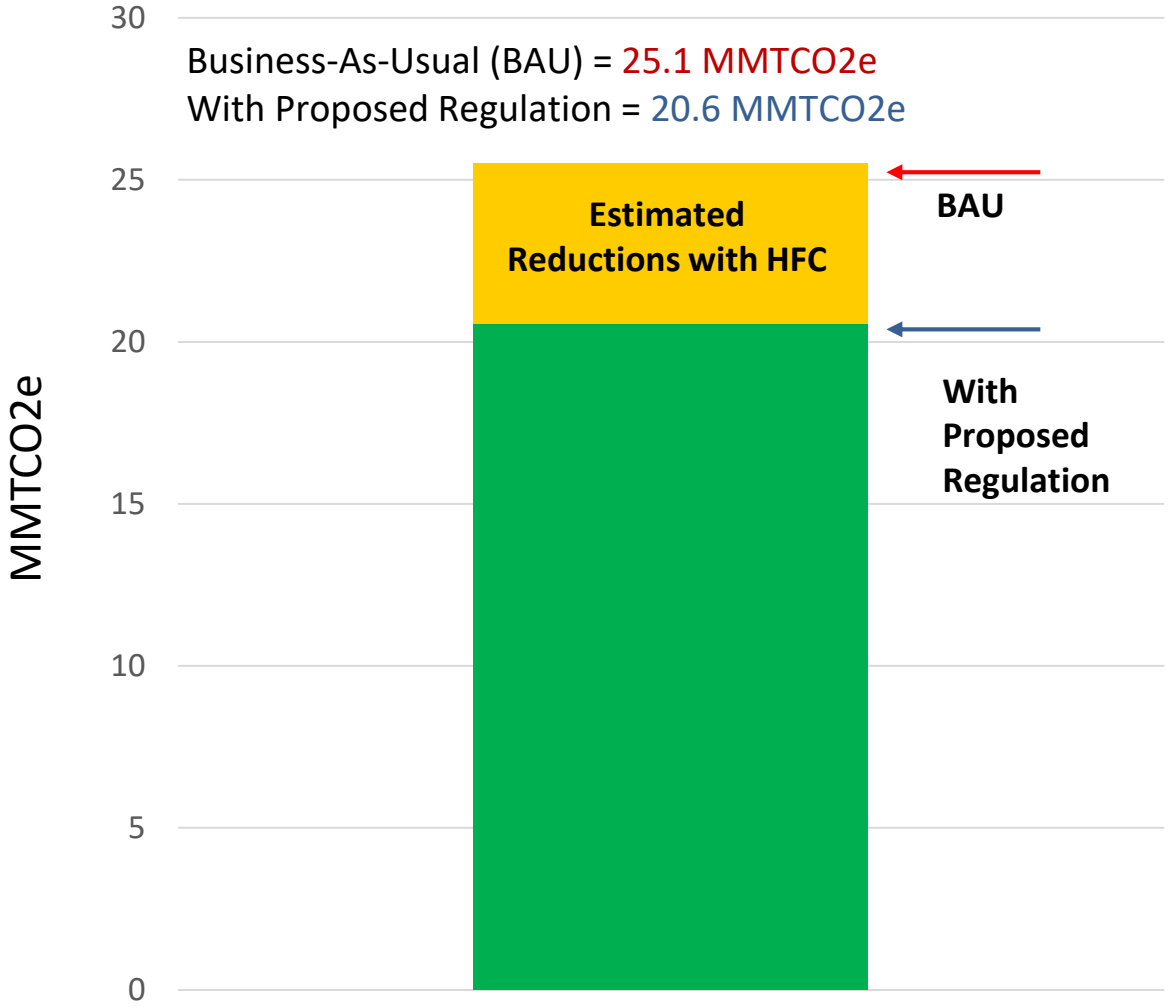
- **Applicability:** manufacturers with products/equipment that contain substances that will be prohibited
  - Manufacturers that have transitioned away from using substances are not subject to this requirement

- **Requirement:** Manufacturers will be required to inform MDE annually of products/equipment that contain substances that will be prohibited, and inform MDE when the manufacturer phases out the use of the substance in products/equipment

- Mirrors Washington State's (WA) language and will model WA's reporting form

Potential Emissions Reduction

- Using the US Climate Alliance Emission tool:



Tentative Schedule

- Air Quality Control Advisory Council: Today
- Proposed Regulation in the Maryland Register: May 2020
- Public Hearing and final comment period: June 2020
- Rule Adoption and Effective: Fall 2020


QUESTIONS …
DISCUSSION