Ozone Depleting Substances Technical Working Group

Meeting #4: June 4th

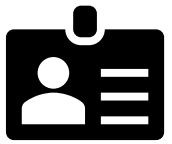
DEPARTMENT OF ECOLOGY
State of Washington

Agenda – Meeting #4

- Topic #1 Additional Refrigerants
- Topic #2 Additional Foams
- Topic #3 Medical Aerosols
- Topic #4 Unused solvents
- Topic #5 Fire Suppressants
- Wrap up and next steps
  - Next meeting: June 25th
- Public comment opportunity

Zoom tips and tricks

Panelists please keep yourself muted unless you're speaking.



Please rename yourself with your affiliation: Click on 'Participants,' hover over your name Click 'More' then 'Rename.'

For panelists please keep your video on as bandwidth allows.

Reminder: Role of this Working Group

- This working group is not tasked with making consensus recommendations or changes to Ecology rule or adopted protocols
- Ecology will consider multiple sources and perspectives, including the input collected through this working group, when deciding how to proceed with changes to this protocol
- Input provided by working group members, even if unanimous, should not be considered an indicator of the changes Ecology may or may not make

Topic #1

Topic: Additional Refrigerants

- Current: Eligible refrigerants
  - CFC-11; CFC-12; CFC-13; CFC-113; CFC-114:CFC-115
- Considered change:
  - Adopt refrigerants eligible for crediting in ACR 2.0 protocol:
    - HCFC-22; HCFC-123
- Alternatives:
  - Allow crediting for contaminated HFC refrigerants and mixed refrigerants
  - Allow crediting for destruction of specific HFC's
    - HFC-134a
    - R-410a
    - R-404a
    - R-407c

Refrigerant eligibility in comparable protocols

ODS Refrigerants	ACR 1.2 Protocol	ACR 2.0 Protocol	VM0016
HCFC-22	Eligible	Eligible	Eligible
HCFC-123	Not eligible	Eligible	Eligible
Contaminated HFC's	Not eligible	Not eligible	Not eligible
Mixed refrigerants	Eligible components of mix are credited	Eligible components of mix are credited	Eligible components of mix are credited
Select HFC's	Not eligible	Not eligible	Not eligible

Reclamation Quantity

- In 2022, HCFC-22 comprised about 30% of all reclaimed refrigerants in the US
  - HCFC-22: 5,684,810 lbs (2,578 tons) in 2022
  - HCFC-123: 444,014 lbs (201 tons)
  - Mixed refrigerants: 724,260 lbs (329 tons)
  - All CFC's: 424,402 lbs (192 tons)
- HFC's reclaimed in 2022
  - HFC-134a: 2,317,825 lbs (1051 tons)
  - R-404a: 443,342 lbs (201 tons)
  - R-407c: 474,205 lbs (215 tons)
  - R-410a: 3,519,058 lbs (1519 tons)

Source: Refrigerant Reclamation Table, 2000-2022, US Environmental Protection Agency (2023) https://www.epa.gov/system/files/documents/2023-12/2022_reclamation_table.pdf

Refrigerants: Regulatory context

- US production and import of HCFC-22 ended on January 1, 2020
  - Use, reclamation, and recovery is still common practice

- US production and import of HCFC-123 will end in 2030
  - HCFC-123 was phased out for new HVAC equipment in 2020, but production for equipment servicing continues

- HFC phase down is mandated by the AIM act and is scheduled to be prohibited in most applications by the late 2020's

Additional refrigerant change logistics

Available quantifications of cumulative emissions factors and substitute emissions

Protocol	HCFC-22	HCFC-123	Contaminated HFC's	Mixed refrigerants	Select HFC's
ACR 2.0	NA	NA	NA	NA	NA
ACR 1.2	Cumulative Emissions Factor and Substitute Emissions Calculated	NA	NA	NA	NA
VM0016	NA	NA	NA	NA	NA

Discussion: Topic 1 Context

- What additional context or considerations related to this topic should Ecology be aware of?
- Has HCFC-22 refrigerant destruction been a significant component of destruction projects through ACR's 1.2 or 2.0 protocol?
- Given that HCFC-123 and HFC's are not fully phased out of production – is there a risk that destruction of this gas would simply result in an increase in production?
- Could destruction of contaminated or mixed gases that are not phased of out of production lead to an increase in production?
  - Is "contaminated" a defined term in industry practice?
- Most HFC's are already phased out for use in new products and equipment in Washington, per WAC 173-443 – could registries adequately enforce a requirement 100% of HFC's used for destruction must be sourced from facilities in Washington?

Discussion: Topic 1

- Should Ecology allow credits to be generated for the destruction of HCFC-22?
- Should Ecology allow credits to be generated for the destruction of HCFC-123?
- Should Ecology allow credits to be generated for the destruction of contaminated HFC's?
- Should Ecology allow credits to be generated for the destruction of all components of mixed gases (which include substances otherwise not eligible for destruction)?
- Should Ecology allow credits to be generated for the destruction of select HFC refrigerants? (E.g. HFC-134a, R-410a, R-404a, R-407c)

Topic #2

Topic: Additional foams

- Current:
  - Eligible foams: CFC-11; CFC-12; HCFC-22; HCFC-141b
- Considered change:
  - Adopt foams eligible for crediting in ACR 2.0 protocol: CFC-114; HCFC-142b; HFC-134a; HFC-245fa; HFC-365mfc

US Consumption of Foams

Note: Data only available for HFC's not limited to foam applications:

- HFC-134a
  - 61,397 tons produced in US in 2022; 51,519 tons consumed in US in 2022 (consumption = production + imports – exports)
- HFC-245fa
  - 17,416 tons produced in the US in 2022; 4,974 tons consumed in US in 2022
- HFC-365mfc
  - 0 tons produced in the US in 2022; 1,109 tons consumed in the US in 2022

- Source: https://www.epa.gov/climate-hfcs-reduction/hfc-data-hub/expanded-hfc-data#Production

Foam eligibility in comparable protocols

ODS Refrigerants	ACR 1.2 Protocol	ACR 2.0 Protocol	VM0016
CFC-114	Not eligible	Eligible	Eligible
HCFC-142b	Not eligible	Eligible	Eligible
HFC-134a	Eligible	Eligible	Not Eligible
HFC-245fa	Eligible	Eligible	Not Eligible
HFC-365mfc	Not Eligible	Eligible	Not Eligible

Foams: Regulatory context

- US production of CFC-114 ended in 1996
- US production and import of HCFC-142b ended in 2020
- US production and import is restricted HFC-134a and will fully phased out in 2028
- HFC-245fa is not fully phased out but is regulated under the AIM act
- HFC-365mfc is not fully phased out but is regulated under the AIM act

Additional foam change logistics

Available quantifications of cumulative emissions factors

Protocol	CFC-114	HCFC-142b	HFC-134a	HFC-245fa	HFC-365mfc
ACR 2.0	NA	NA	NA	NA	NA
ACR 1.2	MA	NA	Cumulative Emissions Factor Calculated	Cumulative Emissions Factor Calculated	NA
VM0016	NA	NA	NA	NA	NA

Discussion: Topic 2 Context

- What additional context or considerations related to this topic should Ecology be aware of?
- For substances that have not been fully phased out – could protocol eligibility lead to production for the purpose of destruction?
- Are these additional foams a potential significant source for destruction?

Discussion: Topic 2

- Should Ecology allow credits to be generated for the destruction of foams that have been fully phased out of production (CFC-114, HCFC-142b)?
- Should Ecology allow credits to be generated for the destruction of foams that have been fully phased out of production (HFC-134a, HFC-245fa, HFC-365mfc)?

Topic #3

Topic: Medical aerosols

- Current:
  - ODS produced as medical aerosols are not eligible for crediting
- Considered change:
  - Adopt medical aerosol eligibility for:
    - CFC-11; CFC-12; CFC-114; HCFC-22; HCFC-142b

Topic: Additional requirements for medical aerosols (ACR ODS 2.0)

- Originate from domestic US stockpiles originally produced before January 1, 2012
- Be eligible for sale for use in medical products that are listed as essential uses by the FDA

Medical Aerosol eligibility in comparable protocols

Medical Aerosols	ACR 1.2 Protocol	ACR 2.0 Protocol	VM0016
CFC-11	Eligible	Eligible	Not Eligible
CFC-12	Eligible	Eligible	Not Eligible
CFC-114	Eligible	Eligible	Not Eligible
HCFC-22	Not Eligible	Eligible	Not Eligible
HCFC-142b	Not Eligible	Eligible	Not Eligible

Medical Aerosols: Regulatory context

- Use of CFC's in medical aerosols was phased out by an FDA rule in 2012
- Use of HCFC-22, HCFC-142b in medical aerosols was prohibited in 2015

Medical aerosols change logistics

Available quantifications of cumulative emissions factors and substitute emissions

Protocol	CFC-11	CFC-12	CFC-114	HCFC-22	HCFC-142b
ACR 2.0	NA	NA	NA	NA	NA
ACR 1.2	Cumulative Emissions Factor and Substitute Emissions Calculated	Cumulative Emissions Factor and Substitute Emissions Calculated	Cumulative Emissions Factor and Substitute Emissions Calculated	NA	NA
VM0016	NA	NA	NA	NA	NA

Discussion: Topic 3 Context

- What additional context or considerations related to this topic should Ecology be aware of?
- Have medical aerosols been a source for destroyed ODS material using ACR's protocols?
- Does destruction of medical aerosols stockpiled for medical use have the potential for adverse public health impacts?

Discussion: Topic 3

- Should Ecology allow credits to be generated from the destruction of medical aerosols?

Topic #4

Topic: Unused solvents

- Current:
  - ODS produced for the purpose of use as solvents are not eligible
- Considered change:
  - Adopt solvent eligibility for:
    - CFC-11; CFC-113; HCFC-123; HCFC-141b; HCFC-225ca, HCFC-225cb

Topic: Additional requirements for halons (ACR ODS 2.0)

- Must be unused
- Must not be considered hazardous waste, and must not be required to be destroyed by RCRA
- Proponent must obtain documentation that the solvent was marketed as a solvent but never used

Solvent eligibility in comparable protocols

Medical Aerosols	ACR 1.2 Protocol	ACR 2.0 Protocol	VM0016
CFC-11	Not Eligible	Eligible	Not Eligible
CFC-113	Not Eligible	Eligible	Not Eligible
HCFC-123	Not Eligible	Eligible	Not Eligible
HCFC-141b	Not Eligible	Eligible	Not Eligible
HCFC-225ca	Not Eligible	Eligible	Not Eligible
HCFC-225cb	Not Eligible	Eligible	Not Eligible

Solvents: Regulatory context

- HCFC-141b was banned from production as a solvent in 2003
- HCFC-225ca and HCFC-225cb were banned from production as solvents in 2015

Unused solvent change logistics

Available quantifications of cumulative emissions factors

Protocol	CFC-11	CFC-12	CFC-114	HCFC-22	HCFC-142b
ACR 2.0	NA	NA	NA	NA	NA
ACR 1.2	NA	NA	NA	NA	NA
VM0016	NA	NA	NA	NA	NA

Discussion: Topic 4 Context

- What additional context or considerations related to this topic should Ecology be aware of?
- Have unused solvents been a source for destroyed ODS using ACR's protocols?

Discussion: Topic 4

- Should Ecology allow credits to be generated from the destruction of unused solvents?

Topic #5

Topic: Fire Suppressants

- Current:
  - No halons are included in list of eligible substances
- Considered change:
  - Allow credits to be generated from the destruction of:
    - Halon 1211
    - Halon 1301

US Consumption of Halons

- 86,288 lbs (43 tons) of halon 1301 imported in 2022

Source: https://www.epa.gov/ozone-layer-protection/halons-program

- As of 2014, there was an estimated 14,000 tons of halon 1301 in north America and 11,000 tons of halon 1211 in north America

Source: https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/hrarc-7022013.pdf

Additional requirements for halons (ACR ODS 2.0)

- Proponent must obtain signed attestation that halon 1301 is not sourced from a strategic stockpile
  - Strategic reserves of halon 1301 are maintained for fire suppression systems in aviation, military use, and other applications

Halon eligibility in comparable protocols

Medical Aerosols	ACR 1.2 Protocol	ACR 2.0 Protocol	VM0016
Halon 1211	Eligible	Eligible	Not Eligible
Halon 1301	Eligible	Eligible	Not Eligible

Halons: Regulatory context

- Halons are controlled under the Montreal Protocol and were phased out in 1994
- Halon production was phased out globally in 2010

Halon change logistics

Available quantifications of cumulative emissions factors

Protocol	Halon 1211	1301
ACR 2.0	NA	NA
ACR 1.2	Cumulative emissions rates, substitute emissions rates are available	Cumulative emissions rates, substitute emissions rates are available
VM0016	NA	NA

Discussion: Topic 5 Context

- What additional context or considerations related to this topic should Ecology be aware of?
- Have halons been a significant source for credit issuance through ACR's protocols?
- Halon 1301 is generally projected to continue to be used at a significant level in aviation and other industries through 2050. If halon destruction was incentivized such that significant quantities were destroyed, would this adversely impact these industries or risk resulting in exemptions to allow further halon production?

Discussion: Topic 5

- Should Ecology allow credits to be generated from the destruction of halon 1211?
- Should Ecology allow credits to be generated from the destruction of halon 1301?

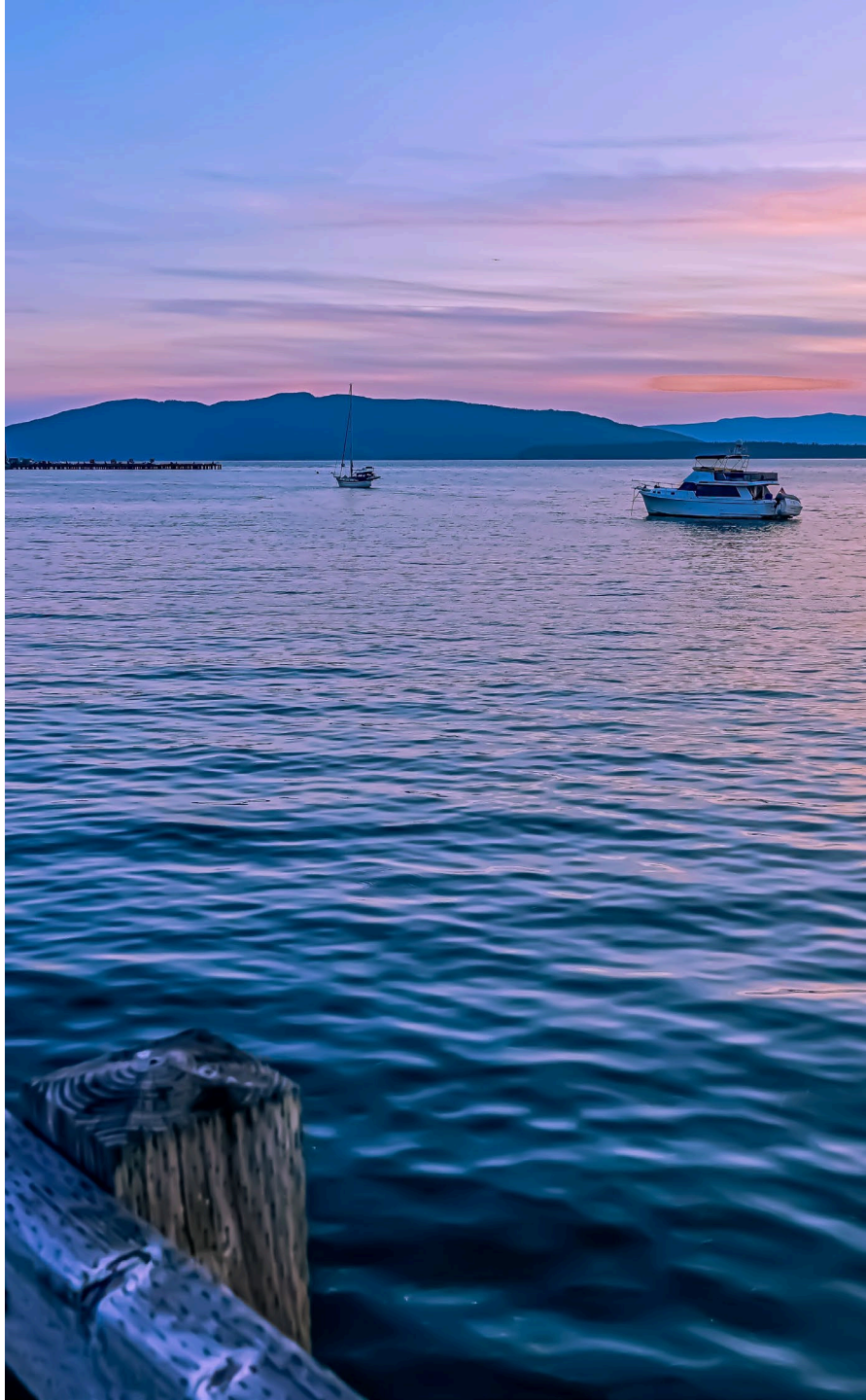
Next steps

- Review summary notes for Meeting #4
- Meeting #5 is June 25th at 8:00 am PT
- Topic for 5th meeting
  - Revisions to point of origin requirements
  - Allow ODS destruction outside of the US
  - Allow ODS sourcing from Canada

Public Comment Opportunity

Guidelines for providing public comment

- Up to two minutes per person
- Host will unmute you and begin timer
- Please keep the comments related to offsets and ozone depleting substances
- Ecology will not respond to comments in this meeting
- To submit written comments, use our digital comment platform
- Please use “raise hand” button to indicate that you wish to provide a comment



Thank you!

Contact:
CCAOffsets@ecy.wa.gov