



# Considered revisions to Ecology's adopted Ozone Depleting Substances Protocol

## Introduction

The following considered revisions summarize and propose a preliminary approach to revise adopted Ozone Depleting Substances (ODS) protocol, informed by input from the Washington Department of Ecology's Ozone Depleting Substances Technical Working Group.<sup>1</sup> This process also identified significant areas for future research, and areas where Ecology believes no action is warranted at this time.

The considered revisions, outlined in Table 1 below, reflect Ecology's preliminary research on this protocol, informed by the ODS Technical Working Group. Before proposing any changes to this protocol Ecology is seeking input from the Environmental Justice Offsets Working Group.<sup>2</sup> In addition to the revisions listed below Ecology will consider opportunities to clarify and make minor process updates to the adopted protocol, such as revisions to document submittal processes, which may not be included here.

Table 1. Summary of Preliminary Proposed Actions

	Topic	Purpose
<b>Considered protocol revisions in current rulemaking</b>		
1	Update Global Warming Potential (GWP) values from AR4 to AR5	Increase methodological rigor
2	Allow ODS sourced from federal government	Remove undue barriers to project development
3	Revise substitute emissions factors for refrigerants	Increase methodological rigor; Reflect policy advances
4	Restrict project invalidation liability	Remove undue barriers to project development
5	Allow credit generation from HCFC-22	Reflect policy advances
6	Allow credit generation from medical aerosols and unused solvents	Remove undue barriers to project development
<b>Proposed topics for continued research in a future rulemaking</b>		
1	Update cumulative emissions rates for refrigerant CFC's	Increase methodological rigor
2	Update cumulative emissions rates, substitute emissions factors, and eligible species of ODS foams	Increase methodological rigor; Reflect policy advances
3	Allow crediting for HCFC-123	Reflect policy advances
4	Allow credit generation from HFC's sourced from Washington	Reflect policy advances

<sup>1</sup> "Ozone Depleting Substances Technical Working Group" (n.d.) EZView. Retrieved from: [https://www.ezview.wa.gov/site/alias\\_1962/38934/offset-ozone\\_depleting\\_substances\\_tech\\_workgroup.aspx](https://www.ezview.wa.gov/site/alias_1962/38934/offset-ozone_depleting_substances_tech_workgroup.aspx).

<sup>2</sup> "Environmental Justice Offsets Working Group" (n.d.). EzView. Retrieved from: [https://www.ezview.wa.gov/site/alias\\_1962/38937/offset-environmental\\_justice\\_offset\\_working\\_group.aspx](https://www.ezview.wa.gov/site/alias_1962/38937/offset-environmental_justice_offset_working_group.aspx).

	Topic	Purpose
5	Revise Point of Origin Requirements	Increase methodological rigor
<b><i>Discussed revisions that are not recommended at this time</i></b>		
1	Allow credit generation from the destruction of halons	Remove undue barriers to project development
2	Allow credit generation from contaminated and mixed HFC’s (sourced outside of Washington state)	Reflect policy advances
3	Allow destruction of ODS outside the United States	Remove undue barriers to project development
4	Allow destruction of ODS sourced from Canada	Remove undue barriers to project development

## Considered protocol changes in current rulemaking

### 1. Update Global Warming Potential values from AR4 to AR5

Ecology is considering updating the global warming potentials used in the protocol from IPCC Assessment Report 4 (AR4) to Assessment Report 5 (AR5). The AR4 values used in the protocol are out of date and no longer reflect the best available science. In most cases, AR4 values are marginally higher than AR5 (meaning that more credits are issued to a project using AR4 values than AR5). Switching to AR5 makes the protocol more up-to-date, more conservative, and also aligns with Ecology’s adopted HFC rule (WAC 173-443-030) which uses AR5 values except where substances are otherwise covered by WAC 173-441, of which none of the current or proposed substances are.

AR5 values have now been adopted by all voluntary offset registries with relevant comparable protocols: ACR, the Climate Action Reserve, and Verra.

Input from the ODS Technical Working Group on this topic largely supported the idea of updating to AR5 values, although many group members advocated for Ecology to adopt AR6 values which are the most up-to-date values available and are significantly higher than either AR4 or AR5 values (which would result in more credits being generated).

Ecology should closely watch voluntary registries and international standard adoption of AR6 values and consider a subsequent update to AR6 in this protocol once these values have been more widely adopted. In an FAQ document in 2024 ACR notes, regarding the question of whether they would use AR6 values in their protocol:<sup>3</sup>

ACR uses AR5 values to align with the decisions of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) and with national inventories (including those of the U.S. and Canada to which this methodology applies). While the IPCC released updated GWP values in the Sixth Assessment Report (AR6), ACR continues to use AR5 GWP values, consistent with international agreements on common metrics which countries are using or transitioning to for their GHG inventory accounting and Nationally Determined Contributions (NDCs).

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<sup>3</sup> “Frequently Asked Questions Destruction Of Ozone Depleting Substances And High-Gwp Foam”(2024). ACR. Retrieved from <https://acrcarbon.org/wp-content/uploads/2024/03/ACR-ODS-v2.0-FAQ-2024-03-11.pdf>.

This change is fairly minor in the text of the protocol but requires recalculation of several associated values in the protocol.

**Proposed changes**

- *Adopt AR5 values, in line with ACR ODS 2.0 and CAR ODS 2.0*
- *Revise substitute emissions values to reflect AR5*

**Summary**

Ecology is considering updating the global warming potentials used in the protocol from IPCC Assessment Report 4 (AR4) to Assessment Report 5 (AR5) since the AR4 values no longer reflect the best available science. Although an AR6 does exist, the values are not yet widely adopted, and Ecology will keep a close eye and update in the future if needed. AR5 values are marginally lower than AR4 meaning this update would lead to less credits being issued for projects using the AR5 values. The purpose of this update is to increase methodological rigor.

**2. Allow ODS sourced from the federal government**

Ecology is considering allowing ODS sourced from the federal government to be eligible for destruction, with some additional safeguards. The existing ODS protocol includes a blanket prohibition on crediting for the destruction of ODS sourced from federal sources (including federal auctions and refrigeration units sourced from federal facilities). Ecology is considering narrowing this prohibition in the protocol to prohibit crediting of refrigerants seized by US customs and specifying that the government nor a federal agency is not eligible to be a project developer.

In making this change, Ecology should adopt the revisions in the Climate Action Reserve's ODS 2.0 protocol, with the additional revision of allowing crediting for the destruction of ODS sourced from federal government installations. Ecology should adopt the point of origin requirements (required documentation regarding where ODS were extracted or stockpiled) concerning ODS sourced from US Government auctions used in the Climate Action Reserve's protocol. Federal facilities and auctions represent a potentially significant supply of ODS which, unless destroyed, will eventually leak out into the atmosphere. Sourcing ODS from federal sources, as opposed to sourcing from private businesses or state or local government does not impact the integrity of the offset credits generated.

Working group members noted that the rationale behind this blanket prohibition on ODS sourced from the federal government was an expectation that federally recovered ODS was already undergoing destruction, absent offset project registration. In the 10 years since the publication of this protocol, there is no evidence that federal destruction of ODS is common practice, and so the destruction of federally sourced ODS is additional to what would normally occur in a conservative business-as-usual scenario.

This is a minor change to the eligibility and point of origin sections of the protocol.

**Proposed changes**

- *Integrate federal eligibility language from ACR's 1.2/2.0 ODS protocols,*
- *Integrate CAR 2.0 ODS customs restriction language*

**Summary**

Ecology is considering allowing ODS sourced from the federal government to be eligible for destruction. The existing protocol does not include ODS sourced from the federal government because there was an expectation that federally recovered ODS was already undergoing destruction but after 10 years there is no evidence this is common practice. The update would prohibit crediting of refrigerants seized by US

customs and specify that the government or a federal agency is not eligible to be a project developer. The purpose of this update is to remove undue barriers to project development.

### **3. Revise substitute emissions factors for refrigerants**

Ecology is considering revising substitute emissions factors for refrigerants, only if adequate emissions are available from the U.S. Environmental Protection Agency (EPA) within the timeframe of this rulemaking process. Substitute emissions factors should be expected to change over time as refrigerants phase out and new substances become industry standard. In general, substitute emissions factors should be expected to decline over time as federal and state laws mandate lower emissions refrigerants systems. Ecology should seek to regularly update substitute emissions factors. Methodological consistency is key to the integrity of the protocol. At this time the EPA vintaging model is the primary source for cumulative emissions rates and substitute emissions factors for refrigerants in the protocol. When substitute emissions factors are available through this model Ecology should seek to adopt them in our protocol, however, if no update values are available in this model, as may be the case for some types of refrigerants, Ecology should retain existing substitute emissions factors rather than seek alternative values for different sources.

This is a minor change to the protocol but should seek alignment with the adopted Global Warming Potential values.

#### ***Proposed changes***

- *Update substitute emissions values in Appendix B of the adopted protocol*

#### ***Summary***

Generally substitute emissions factors should be expected to decline over time as federal and state laws mandate lower emissions refrigerants systems. The EPA vintaging model is the primary source for calculating these emission rates. If the EPA model has updated emission factors within this rulemaking, Ecology will update them. If not, Ecology will retain existing factors. The purpose is to increase methodological rigor and reflect policy advances.

### **4. Restrict invalidation liability**

Ecology is considering clarifying the scope of regulatory non-compliance that may result in the invalidation of an ODS offset credit. Offset invalidation is a process of cancelling an offset after it has already been issued. Invalidation is warranted if offset project data report contains errors that overstate the amount of greenhouse gas emissions reductions or removals by more than 5%, or if the project activities have been found to not have been in accordance with all local, state, federal law, or Ecology determines that the credits have been double counted with another offset program. If, after an investigation, Ecology determines that an offset is invalid, this offset will be removed from any holding, compliance, or forest buffer account. Even if that offset has been used for compliance, that covered entity must replace the invalidated offset with a valid compliance instrument. Invalidation can only happen within a certain period of time – 8 years after issuance by Ecology, and that window can be reduced down to 3 years if the developer conducts a second independent 3rd party verification with a different verifier.

Although invalidation has been very rare in California Air Resources Board's (CARB) program for ODS projects, the risk of invalidation carries a financial cost. Typically in CARB's program credits with an 8-year invalidation window trade for less than credits with a 3-year invalidation window which in turn trade for less than credits whose invalidation window has passed. About 70% of ODS projects in CARB's program have completed a 2nd verification indicating the financial cost of the 8-year invalidation

window risk is either greater than the cost of additional 3rd party verification, or that buyers expect invalidation windows to be minimized to the extent possible.

The scope of invalidation from a regulatory non-compliance event for an ODS project is potentially ambiguous in the rule language. Existing rule language could be interpreted to mean that any non-compliance event, even unrelated to the destruction, handling, or disposal of ODS may be grounds for invalidation. Destruction facilities are typically quite large with a range of unrelated activities co-occurring at any given time. A non-compliance event may be entirely outside the scope of the ODS and thus outside of the control of the project proponent. Ecology should add language to the rule (not the protocol) that specifies the scope of invalidation liability for ODS projects to not extend to activities unrelated to destruction. Draft preliminary language to add to WAC 173-446-580(3)(b) is the following:

*(i) For offset projects using the ozone depleting substances (ODS) protocol non-compliance events that do not directly impact ODS handling, destruction, and emissions from ODS processing will not be considered grounds for an initial determination of invalidation*

Working group participants were generally, but not universally, in support of this change but noted that the rule language must be carefully crafted to ensure that all non-compliance events related to ODS destruction remain included within a project's invalidation liability.

#### **Proposed changes**

- Add text to WAC 173-446-580(3)(b)
- No changes to the protocol are required

#### **Summary**

Ecology is considering clarifying potentially ambiguous in the rule language on the scope of regulatory non-compliance that may result in the invalidation of an ODS offset credit. Since ODS destruction facilities deal with a range of activities, many unrelated to ODS destruction, Ecology is considering adding language to the rule (not the protocol) that specifies the scope of invalidation liability for ODS projects does not extend to activities unrelated to destruction. The purpose is to remove undue barriers to project development.

### **5. Allow credit generation from HCFC-22**

Ecology is considering allowing for credits to be generated for the destruction of HCFC-22 and adopting appropriate cumulative leak rates and substitute emission factors for this substance. HCFC-22 was phased out of production and import in 2020, however, use, reclamation and reuse of the refrigerant continue to be common practice. In 2022, more than 10 times more HCFC-22 was reclaimed than all CFC's combined creating a significant opportunity to incentivize destruction of HCFC-22, rather than reclamation and reuse that will ultimately result in leakage to the atmosphere. Because production and import of HCFC-22 has been phased out of production and import since 2020, credits generated by the destruction of this material can be considered additional, because there is no risk that additional HCFC-22 could be produced to replace the destroyed material. As with CFC's, deductions should be made to reflect the amount of the substance that would have leaked over the next 10 years and the emissions from the expected leakage of substitute refrigerants. HCFC-22 destruction is eligible for crediting in ACR's ODS 2.0 protocol, Verra's VM0016 protocol as well as Quebec's Halocarbon destruction protocol.

Working group members were predominantly in support of allowing credit generation from HCFC-22, and noted the significant emissions reduction potential of incentivizing the destruction of this substance. A consideration was raised that HCFC-22 is used as a feedstock for the purpose of synthetic polymer production, namely for the production of Teflon. Because HCFC-22 production is still allowed as

a feedstock, the question was raised of whether destruction of reclaimed HCFC-22 can be considered additional, when that reclaimed HCFC-22 could theoretically be used a feedstock and supplant the need for production of additional gases. Although comprehensive data does not appear to be available, emissions for HCFC-22 as feedstock (estimated at 25 million MT CO<sub>2</sub>e<sup>4</sup>) are a small portion of the total estimated emissions of HCFC-22 (approximately 400 million MT CO<sub>2</sub>e<sup>5</sup>). In addition, use of HCFC-22 as a feedstock is less common in the United States than in developing countries<sup>6</sup> and crucially there is no evidence that reclaimed HCFC-22's are used for feedstocks – presumably because feedstock use requires a level of purity that is not commonly found in reclaimed refrigerants. Because 1) the quantity of reclaimed HCFC-22 appears to far exceed the demand for HCFC-22 as a feedstock, and 2) reclaimed HCFC-22 used as a feedstock appears to be purely theoretical. The potential for destruction of this substance to contribute to the production of new HCFC-22 for feedstock purposes appears to be quite low, particularly in comparison with the potential environmental benefit of incentivizing the destruction of this potent greenhouse gas.

### ***Proposed changes***

- *Add HCFC-22 to list of eligible refrigerants*
- *Adopt corresponding cumulative leak rate and substitute emissions factors*

### ***Summary***

Ecology is considering allowing for credits to be generated for the destruction of HCFC-22 and adopting appropriate cumulative leak rates and substitute emission factors for this substance. HCFC-22 was phased out of production and import in 2020 and credits generated by the destruction of this material can be considered additional, because there is no risk that additional HCFC-22 could be produced to replace the destroyed material. The purpose of this change is to reflect policy advances.

## **6. Allow credit generation from medical aerosols and unused solvents**

Ecology is considering allowing credit generation for eligible CFC's and HCFC's that were marketed as medical aerosols or marketed as solvents but remain unused. In addition to their use as refrigerants, CFC's have been used as medical aerosols (such as metered dose inhalers) and solvents (often in dry cleaning and industrial applications). Destruction of CFC's designated for either purpose is expressly prohibited in the Ozone Depleting Substances Projects (November 14, 2014) Protocol, adopted by Ecology. ACR's ODS protocols have allowed crediting for destruction of ODS labeled for use as medical aerosols starting in the 1.0 version of the protocol and allowed crediting for destruction of ODS labeled for use as solvents, but never used for that purpose starting in the 2.0 version of that protocol. Working

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<sup>4</sup> Mühle, J., Kuijpers, L. J., Stanley, K. M., Rigby, M., Western, L. M., Kim, J., ... & Weiss, R. F. (2022). Global emissions of perfluorocyclobutane (PFC-318, c-C 4 F 8) resulting from the use of hydrochlorofluorocarbon-22 (HCFC-22) feedstock to produce polytetrafluoroethylene (PTFE) and related fluorochemicals. *Atmospheric Chemistry and Physics*, 22(5), 3371-3378.

<sup>5</sup> Xiang, B., Patra, P. K., Montzka, S. A., Miller, S. M., Elkins, J. W., Moore, F. L., ... & Wofsy, S. C. (2014). Global emissions of refrigerants HCFC-22 and HFC-134a: Unforeseen seasonal contributions. *Proceedings of the National Academy of Sciences*, 111(49), 17379-17384

<sup>6</sup> Mühle, J., Kuijpers, L. J., Stanley, K. M., Rigby, M., Western, L. M., Kim, J., ... & Weiss, R. F. (2022). Global emissions of perfluorocyclobutane (PFC-318, c-C 4 F 8) resulting from the use of hydrochlorofluorocarbon-22 (HCFC-22) feedstock to produce polytetrafluoroethylene (PTFE) and related fluorochemicals. *Atmospheric Chemistry and Physics*, 22(5), 3371-3378.

group participants noted that a CFC intended for use as a solvent, medical aerosol, or refrigerant will be chemically identical and often the packaging that it comes in is the only factor distinguishing its use.

Use of CFC's in medical aerosols was phased out by an FDA rule in 2012<sup>7</sup>, and use of HCFC-22 in medical aerosols was prohibited in 2015.<sup>8</sup> Working group members agreed that this change is unlikely to significantly increase the supply of eligible CFC's for destruction. Working group members also noted that medical aerosol destruction may often be cost prohibitive due to small quantities and the need for proper handling of medications in those aerosols.

Two approaches that Ecology may consider to incorporate this change are:

1. Adding modules within the protocols to allow for the credits issuance for destruction of medical aerosols and unused solvents, with specific cumulative emissions rates and substitute emissions factors for each or
2. Simply removing the prohibition in CARB's protocol that prohibits credits issuance for destruction of these substances, while retaining a prohibition on the destruction of any used solvents, medical aerosols stockpiled after 2012 or ineligible for sale as medical products, and any solvents listed as a hazardous waste by the EPA under EPA CFR 261 subpart D.

Option 2 can be considered the more conservative approach as ACR's 1.2 protocol uses a 100% cumulative emissions rate for medical aerosols, and ACR's 2.0 removes the cumulative emissions rates and substitute emissions factors all together, indicating an implied 100% emissions rate. ACR's ODS 2.0 protocol allows for crediting for some medical aerosols substances (HCFC-142b) and solvents (HCFC-141b, HCFC-225ca, HCFC-225cb, HCFC-123) that are not permitted for crediting as refrigerants.

Given that packaging may be the only distinguishing factor between ODS refrigerants and ODS medical aerosols and solvents, Ecology should not allow crediting for the destruction of medical aerosols and unused solvents that would not otherwise be allowed for refrigerants. Option 2 is a conservative approach that removes any incentive for mis-categorizing an ODS as a medical aerosol or unused solvent in order to attain a more favorable cumulative emissions rate.

### **Summary**

Ecology is considering allowing credit generation for eligible CFC's and HCFC's that were marketed as medical aerosols or marketed as solvents but remain unused. A CFC intended for use as a solvent, medical aerosol, or refrigerant will be chemically identical to CFCs in refrigerants and often the packaging that it comes in is the only factor distinguishing its use. The potential approach by Ecology to incorporate this change would be a conservative approach that removes any incentive for mis-categorizing an ODS as a medical aerosol or unused solvent in order to attain a more favorable cumulative emissions rate. The purpose of this change is to remove undue barriers to project development.

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<sup>7</sup> Research, C. for D. E. and. (2018). Phase-Out of CFC Metered-Dose Inhalers Containing flunisolide, triamcinolone, metaproterenol, pirbuterol, albuterol and ipratropium in combination, cromolyn, and nedocromil - Questions and Answers. FDA. <https://www.fda.gov/drugs/information-drug-class/phase-out-cfc-metered-dose-inhalers-containing-flunisolide-triamcinolone-metaproterenol-pirbuterol-0>.

<sup>8</sup> Environmental Protection Agency. (2016, April 26). *Substitutes in aerosol propellants*. EPA. [https://19january2017snapshot.epa.gov/snap/substitutes-aerosol-propellants\\_.html](https://19january2017snapshot.epa.gov/snap/substitutes-aerosol-propellants_.html).

## **Opportunities for further research to consider in a future rulemaking process**

### **1. Updates to cumulative emissions rates for refrigerant CFC's**

EPA's Vintaging Model, an internal model which provided the outputs used to calculate cumulative emission rates in this protocol, is no longer able to generate updated leak rates for refrigerant CFC's as their model no longer tracks these substances. An output from this model was obtained to estimate a cumulative emissions factor for HCFC-22, which remains covered by the model.

Ecology should seek alternative sources for CFC leak rates, while continuing to use existing cumulative emissions rates in the absence of a clear alternative source. Emissions rates reflect the type of equipment where the ODS are found. Because no equipment that uses CFC refrigerants was manufactured after 1994<sup>9</sup> we can reasonably expect that leak rates would not have changed significantly since these values were collected in 2010-2012, as the equipment they pertain to remains the same.

Use of existing cumulative emissions rates remains reasonable, despite updated values no longer being available in the Vintaging Model however Ecology should seek an alternative source to update these values in the future and consider use of leak rates for CFC that reflect a "business as usual" scenario of stockpiling of these gases, rather than continued use in increasingly out of date equipment.

### **2. Updates to cumulative emissions rates, eligible species of ODS foams, and foam handling procedures**

Although foam destruction is allowable in the existing protocol, foam destruction projects have remained financially infeasible in the market due to the lower density and lower crediting of ODS within foams, compared with refrigerants. In order to holistically revise foam requirements in the protocol this section of the protocol should be reviewed and considered in its entirety, as updates to any single component (e.g. cumulative emissions rates) are unlikely to make foam destruction viable. Additional eligible species of ODS foams should be considered (such as HCFC-142b, HFC-134a, HFC-245fa, and HFC-365mfc), along with revised foam handling procedures that reduce the need for costly sampling. Even with these revisions it is not clear that foam destruction would become a viable project type, as ACR's ODS 2.0 protocol which introduced these changes has seen little or no uptake in foam destruction projects.

A critical area of research related to ODS foams that Ecology needs to review prior to adopting any changes is appropriate cumulative emissions rates. When the existing protocols were developed two studies were used as the basis for the cumulative emissions rates in the protocol (Scheutz, et al (2007) and Fredenslund, et al (2005)). Since the development of this protocol, the EPA's Vintaging Model now provides cumulative emissions rates for foams and ACR's recent protocols have used new research to derive cumulative emissions rates from foams. These new sources broaden, rather than reduce, the uncertainty of cumulative emissions rates for these substances (see table 2).

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<sup>9</sup> US EPA, O. (2014, April 29). *PRN 93-4: Ban on Aerosol Products Containing CFCs and HCFCs under the Clean Air Act*. [www.epa.gov](https://www.epa.gov/pesticide-registration/prn-93-4-ban-aerosol-products-containing-cfcs-and-hcfc-under-clean-air-act#:~:text=The%20HCFC%20ban%20is%20effective). <https://www.epa.gov/pesticide-registration/prn-93-4-ban-aerosol-products-containing-cfcs-and-hcfc-under-clean-air-act#:~:text=The%20HCFC%20ban%20is%20effective>.



*Table 2. Comparison of Cumulative Emissions Rates for Foams*

Cumulative 10 year Emission Rate	Existing Protocol (Appliance Foams)	Existing Protocol (Building Foams)	EPA Vintaging Model Output	ACR ODS 1.2 Protocol (Appliance Foams)	ACR ODS 1.2 Protocol (Building Foams)
CFC-11	44%	20%	5%	70%	88%
CFC-12	55%	36%	0%	N/A	88%
HCFC-22	75%	65%	10%	69%	87%
HCFC-141b	50%	29%	12%	69%	87%

Existing estimates of cumulative emissions rates for foams, which all reflect the same end-of-life scenario of landfilling, range widely. Ecology should conduct additional review and evaluation of these disparate leak rates in order to determine which values most accurately reflect a conservative business-as-usual scenario, before proceeding with any changes to the foam section of this protocol.

### **3. Allow credit generation from HFC's sourced in Washington**

Washington's HFC program (WAC 173-443) requires a broad phaseout of HFC's in new products and equipment in the state.<sup>10</sup> Ecology should consider methods to incentivize the destruction of these HFC's rather than their reclamation and reuse in existing equipment from which they will eventually leak out into the atmosphere, which is the most likely scenario absent destruction. In order to adopt this change Ecology must ensure that the program can adequately require and ensure that all HFC destruction credited in the program comes from HFC's sourced from equipment in Washington, where HFC's are phased out, rather than from out-of-state equipment, where new HFC's may not have been phased out. This revision presents an important opportunity to avoid emissions from HFC's but must be implemented carefully and include revisions to chain of custody and point of origin components of the protocol as they relate to HFC's.

### **4. Allow credit generation from HCFC-123**

Allowing for credit generation from the destruction of HCFC-123 was considered. HCFC-123 importation is still allowed, although these imports are regulated and phased down over time. This permissible importation raises some additionality concerns. Additionally, the Global Warming Potential of HCFC-123 is comparatively quite low (77 per AR4, compared with 1,810 for HCFC-22) and so is unlikely to present a destruction opportunity.

### **5. Revise Point of Origin requirements**

In future research Ecology should consider revising point of origin requirements for refrigerants. These revisions may include amending the threshold weight at which a source of ODS is considered a point of origin (currently 500 lbs), establishing a date before which stored ODS may be considered a stockpile, and revising requirements related to providing information on equipment that ODS was extracted from. Working group members raised concerns about unintended consequences of these changes, such as

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<sup>10</sup> "Hydrofluorocarbon transition" (n.d.). Dept. of Ecology. Retrieved from <https://ecology.wa.gov/hydrofluorocarbons>.

ways in which these changes could allow otherwise ineligible ODS (such as ODS from international sources) to attain eligibility, and uncertain burdens to verifiers.

## **Considered revisions that are not proposed at this time**

### **1. Allow credit generation from halons**

Ecology presented to working group members a considered revision to allow credit generation from halons. Based on input provided by the working group, Ecology should not pursue this revision at this time. Although halons are phased out of production, they remain necessary in many applications including aviation and will continue to be needed for the foreseeable future. There are some halon alternatives gaining adoption<sup>11</sup>, particularly in the EU, but the current demand for halons in critical industries raises the risk that if halon destruction occurs at a significant level there may be a regulatory response to provide halon production exemptions, threatening the additionality of this destruction.

Ecology should closely monitor the policy landscape and industry practices regarding halons in the US. If halon substitutes begin to see significant adoption in the United States Ecology should consider pursuing this revision.

### **2. Allow credit generation from HFC's – included mixed and contaminated HFC's**

Ecology presented to working group members a considered revision to allow credit generation from HFC's—specifically HFC's that are contaminated or mixed and are otherwise not likely to be viable for reuse would likely be stockpiled. Working group members identified several sources of ambiguity in this considered revision, such as the definition of “mixed” and “contaminated” and suggested that the threshold at which a substance may be considered contaminated will vary by substance, and change over time as technology improves. Working group members also agreed that, because HFC's are being phased down, but not fully phased out of production this could result in malfeasance where a developer intentionally contaminates or mixes and HFC to become viable for destruction. This revision is not recommended at this time.

### **3. Destruction of ODS sourced from Canada**

Ecology presented a considered revision to allow ODS sourced from Canada to be eligible for destruction, reflecting ACR's ODS 2.0 protocol. Working group members noted the intersecting regulatory programs in Canada that impact lifecycle management of ODS in Canada. Given existing programs in Canada, such as the RMC,<sup>12</sup> ODS sourced from Canada could not be clearly considered additional and this revision should not be pursued at this time.

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<sup>11</sup> Uniting Aviation. (2019, January 25). *Aircraft fire extinguishing systems: replacing the halon*. Unitingaviation.com. <https://unitingaviation.com/amp/news/safety/aircraft-fire-extinguishing-systems-replacing-the-halon>.

<sup>12</sup> *Refrigerant Management Canada*. (n.d.). Www.hrai.ca. <https://www.hrai.ca/refrigerant-management-canada>.

### **Destruction of ODS at facilities outside the United States**

Ecology presented a considered revision to allow ODS sourced from facilities outside the United States, in line with ACR's ODS 2.0 protocol. Working group members raised the limited destruction capacity in north America, outside the United States, and were generally in agreement that destruction facility requirements are more rigorous in the United States than in some other countries. Allowing destruction at facilities outside the United States presents the risk of facilitating aggregation at facilities with less strong environmental safeguards and should not be pursued at this time. Working group members did note that if some additional substances become eligible for crediting, such as halons, the only destruction capacity for these substances may exist outside the United States and Ecology could consider approval of destruction in specific countries with comparable destruction requirements.

### **Contact**

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