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U.S. Environmental Protection Agency
1200 Pennsylvania Ave SW
Washington, DC 20460



Attention: Docket # EPA-HQ-OPPT-2019-0437-0001

Ozone Depletion Risks Posed by Emissions of Methylene Chloride, Carbon Tetrachloride, and Other Short-lived Chlorinated and Brominated Chemicals Under Evaluation by the Amended Toxic Substances Control Act (TSCA)

The Environmental Investigation Agency (“EIA”) submits these comments to the U.S. Environmental Protection Agency (“EPA”) regarding the draft risk evaluation for methylene chloride (also known as dichloromethane or CH₂Cl₂) and other priority chemicals undergoing risk evaluations under the Amended Toxic Substances Control Act (“TSCA”). EIA is an independent environmental campaigning organization based in Washington D.C., working worldwide to protect the global climate, forests and threatened species with intelligence, for the benefit of people and wildlife. We have undertaken groundbreaking investigations into the illegal trade in ozone depleting substances (“ODS”) since the mid-1990s, including uncovering widespread illegal use of CFC-11 in China in 2018¹, and have been closely involved in the international ozone and climate negotiations for more than two decades.

EIA strongly urges EPA to examine ozone depletion as a risk to human health and the environment in evaluating methylene chloride, carbon tetrachloride, and all other chlorinated and brominated chemicals undergoing prioritization under the Amended TSCA. We further recommend that EPA consider all available scientific information regarding observed global and regional emission trends and concentrations of methylene chloride and other substances when considering these risks, and not to rely solely on industry reported data. Rapidly rising emissions of methylene chloride and other chemicals have the potential to significantly delay recovery of the ozone layer. We are particularly concerned about the potential connection between these emissions observations and increasing trends in use for feedstock and other intermediate uses for manufacturing of various fluorochemicals.

Delayed recovery of the ozone layer could contribute to higher levels of ultraviolet radiation and pose risks to the environment and human health of the general population. Increased exposure to ultraviolet radiation, and specifically ultraviolet B (UVB) radiation, increases the incidence of ocular pterygium,

¹ See EIA, Preventing Illegal Trade, <https://eia-global.org/initiatives/preventing-illegal-trade>; See also: NYTimes (June 2018), In a High-Stakes Environmental Whodunit, Many Clues Point to China, <https://www.nytimes.com/2018/06/24/world/asia/china-ozone-cfc.html>

cataracts, and all three types of skin cancer.² Studies have found that for every 1% decrease in ozone cataracts is expected to rise 0.5%, and for every 1% increase in UVB radiation, there is a corresponding 2% increase in skin cancer incidence.³ The Montreal Protocol has been found to have successfully prevented a 20% increase in ultraviolet radiation.⁴ However, increasing emissions of ozone depleting substances not sufficiently controlled under the Montreal Protocol could significantly delay full recovery of the stratospheric ozone layer to pre-1960 levels.

Methylene chloride, carbon tetrachloride (“CTC”) and twelve other short-lived chlorinated and brominated substances being prioritized as chemicals for re-evaluation under TSCA (*see Appendix I*) have potential to contribute to ozone depletion and delay full recovery of the stratospheric ozone layer. Our comments provide information and data to show that methylene chloride, CTC and other short-lived substances are of growing concern to the scientific community in terms of their contribution to ozone depletion. In addition, Title VI Clean Air Act (“CAA”) regulations intended to limit emissions of ozone depleting substances, exempt feedstock and process agents under the Montreal Protocol and associated domestic implementation, and thus does not sufficiently monitor and assess short lived ODS, feedstock and other intermediate uses. Other sources of emissions, such as methylene chloride’s unascertained use in oil and gas extraction, may also be contributing to concerning emission trends.

It is imperative that EPA assess risks of ozone depletion for methylene chloride and other chlorinated and brominated substances under TSCA for the following reasons outlined in further detail in our comments:

- Rapidly rising emissions of methylene chloride and other short-lived substances are of increasing scientific concern to the scientific community due to potential for ozone depletion. Continued trends in methylene chloride emissions have the potential to delay healing of the ozone layer by up to 30 years.
- Unascertained use of methylene chloride in oil and gas extraction acknowledged in EPA’s scoping document and draft risk evaluation and studies documenting detection near shale gas wells raises questions regarding any potential link between rapidly rising atmospheric emissions during the same time period as rapid expansion of shale gas drilling in the United States.
- Scientific findings have observed regional US CTC emissions to be several orders of magnitude greater than those reported to EPA’s Toxics Release Inventory, suggesting higher unreported emissions from feedstock use or other unknown sources.
- There is a remaining 15 Gigagram uncertainty gap in estimations between higher top-down emissions derived from atmospheric observations versus bottom-up global CTC emissions from known sources.
- Feedstock and other intermediate uses of methylene chloride, CTC and many other chlorinated substances are growing and may be contributing to these concerning emission trends.

² Norval, M., et al. "The effects on human health from stratospheric ozone depletion and its interactions with climate change." *Photochemical & Photobiological Sciences* 6.3 (2007): 232-251.; de Gruijl, Frank, and Jan Leun. "Environment and health: 3. Ozone depletion and ultraviolet radiation." *Cmaj* 163.7 (2000)

³ de Gruijl, Frank, and Jan Leun. "Environment and health: 3. Ozone depletion and ultraviolet radiation." *Cmaj* 163.7 (2000): 851-855.; Scotto, Joseph, Thomas R. Fears, and Joseph Francis Fraumeni. "Incidence of nonmelanoma skin cancer in the United States." (1983). <http://www.ciesin.columbia.edu/docs/001-526/001-526.html>

⁴ McKenzie et al. "Success of Montreal Protocol Demonstrated by Comparing High-Quality UV Measurements with "World Avoided" Calculations from Two Chemistry-Climate Models." (2019). <https://www.nature.com/articles/s41598-019-48625-z>

- CAA Title VI regulations exempts feedstock and other intermediate uses of ozone depleting substances, risk of which are therefore not being assessed.
- Short-lived ozone depleting substances are also excluded in most CAA Title VI regulations, with only limited assessment of risks for those used as alternatives to Class I and II ODS.
- Unregulated feedstock and intermediate uses are expected to increase in the near future with increasing production of next generation refrigerants and foam blowing agents.

Growing Scientific Concern Regarding Ozone Depletion from Very-Short-Lived Substances

The global ozone layer is widely seen to be on a path toward full recovery by mid-century as a result of the global phase-out of Class I and Class II ODS under the Montreal Protocol. However, a growing number of scientific studies have focused on rising concentrations of short-lived chlorinated and brominated substances, including methylene chloride and a number of others such as chloroform, trichloroethylene, 1,2-dichloroethane, and perchloroethylene, termed ‘very short-lived substances’ (“VSLS”). Once considered insignificant, VSLS are increasingly seen as a threat to the progress made by the Montreal Protocol to protect the ozone layer and prevent resulting harm to human health and the environment from the effects of increased exposure to ultraviolet radiation.

VSLS are defined as ozone depleting substances that have short atmospheric lifetimes typically about 6 months or less.⁵ Short lifetimes prevent VSLS from thoroughly mixing in the atmosphere and reaching the stratosphere, as they break-down more readily closer to Earth’s surface. The ozone depletion potential (ODP) of VSLS is therefore highly dependent on where and when (time of year) the substance is released,⁶ so much so that ODP can vary by a factor of 2-3 depending on where emissions occur.⁷

Historically, VSLSs have not been monitored and controlled under the Montreal Protocol since it was assumed that they would have negligible impact on stratospheric ozone due to their short atmospheric lifetimes. Recent studies, however, refute these assumptions and suggest that stratospheric and upper tropospheric ozone can be harmed by VSLS.⁸ Models have shown that increased atmospheric chlorine concentrations from VSLS may be slowing the rate of ozone recovery by 15%.⁹ Additional models predict that for 5 parts per trillion of bromine introduced to the atmosphere from VSLS about 1.3% of global total ozone is destroyed, as bromine is on average 60 times more efficient at destroying ozone than chlorine.¹⁰

⁵ Claxton, Tom, et al. "On the Regional and Seasonal Ozone Depletion Potential of Chlorinated Very Short-Lived Substances." *Geophysical Research Letters* 46.10 (2019): 5489-5498.

⁶ Ko, M. K. W., et al. "Very short-lived halogen and sulfur substances, Scientific assessment of ozone depletion: 2002, Global Ozone Research and Monitoring Project." *World Meteorological Organization* (2003): 2-57.

⁷ Claxton et al., On the Regional and Seasonal Ozone Depletion Potential, 5496

⁸ Ko et al., Very short-lived halogen and sulfur substances, 1

⁹ Hossaini, Ryan, et al. "Recent trends in stratospheric chlorine from very short-lived substances." *Journal of Geophysical Research: Atmospheres* 124.4 (2019): 2318-2335.

¹⁰ Aschmann, Jan. "Impact of Very Short-Lived Substances on Stratospheric Bromine Loading." PhD diss., Ph. D. thesis, Institute of Environmental Physics, University of Bremen, available at: <http://nbn-resolving.de/urn:nbn:de:gbv:46-00102329-11>,(last access: 20 November 2012) 2011, 2011; Laube, Johannes Christian, et al. "Contribution of very short-lived organic substances to stratospheric chlorine and bromine in the tropics—a case study." *Atmospheric Chemistry and Physics* 8.23 (2008): 7325-7334.

One recent study has observed unexpected decreases in ozone in the lower stratosphere at lower more populated latitudes which may be offsetting ozone layer recovery, as would be expected from increased chlorine production closer to the sources of VSLs emissions.¹¹ Joanna Haigh a co-author in the study has stated, "*The potential for harm in lower latitudes may actually be worse than at the poles. The decreases in ozone are less than we saw at the poles before the Montreal Protocol was enacted, but UV radiation is more intense in these regions and more people live there.*"¹² Although the cause is yet to be conclusively determined, increasing anthropogenic emissions of VSLs such as methylene chloride have been pointed to, as one explanation alongside changing atmospheric dynamics.¹³

Rapidly Rising Global Emissions of Methylene Chloride

Recent observations show global emissions of methylene chloride are increasing rapidly. Surface concentrations increased by 8% per year between 2000 and 2012.¹⁴ Methylene chloride accounts for the majority of the rise in total chlorine from VSLs between 2012 and 2016.¹⁵ A study in Nature Communications on "*The increasing threat to stratospheric ozone from dichloromethane*" examined current emissions trends (See Image 1 below) to make future projections on the impact of methylene chloride on ozone layer recovery. It concluded that constant emissions of methylene chloride at 2016 levels would contribute to a five-year delay in recovery of the ozone layer, while **continued growth in methylene chloride emissions at current rates could delay full recovery of the ozone layer by 30 years.**¹⁶ The likelihood of a continuing increase in methylene chloride emissions absent any steps to prevent them poses an increasing risk to significant delay in full recovery of the ozone layer. Therefore, the threat posed by methylene chloride appears to be the most prominent of any of the known VSLs substances.

In contrast with atmospheric observations, reported releases of methylene chloride under EPA's Toxics Release Inventory ("TRI") have decreased since 2008 (see Figure 1). These figures do not account for smaller sources that fall below EPA's reporting threshold, under-reporting of feedstock or other emissions, or potential sources of emissions from sectors not covered by TRI reporting, such as oil and gas extraction. According to reported data under TRI, 2.9 million pounds of methylene chloride, or 1,315 metric tons, were released in the United States in 2018 of which 1.7 million pounds or nearly 60% were reported under NAICS code 325 by the chemical manufacturing sector.

¹¹ William T. Ball et al., "Evidence for a continuous decline in lower stratospheric ozone offsetting ozone layer recovery." *Atmospheric Chemistry and Physics*, 2018; 18 (2): 1379 DOI: 10.5194/acp-18-1379-2018

¹² Phys.org, "Ozone at lower latitudes is not recovering, despite Antarctic ozone hole healing." (February 6, 2018). <https://phys.org/news/2018-02-ozone-latitudes-recovering-antarctic-hole.html>

¹³ Supra note 2.

¹⁴ Hossaini, R. et al. "Efficiency of short-lived halogen at influencing climate through depletion of stratospheric ozone." *Nat. Geosci.* 8, 186–190 (2015).

¹⁵ World Meteorological Association, United Nations Environment Programme, NOAA, NASA, European Commission Scientific Assessment of Ozone Depletion (2018), at ES20.

¹⁶ Hossaini, R., Chipperfield, M., Montzka, S. et al. "The increasing threat to stratospheric ozone from dichloromethane." *Nature Communications*. (2017). Available at: <https://www.nature.com/articles/ncomms15962>

Image 1: Trends in Methylene Chloride (CH₂Cl₂) Emissions (Hossaini et al., 2018)

Figure 2: Time trend in global halocarbon emissions.

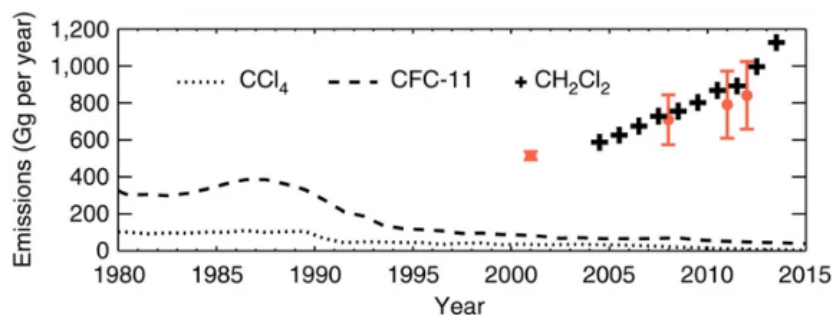
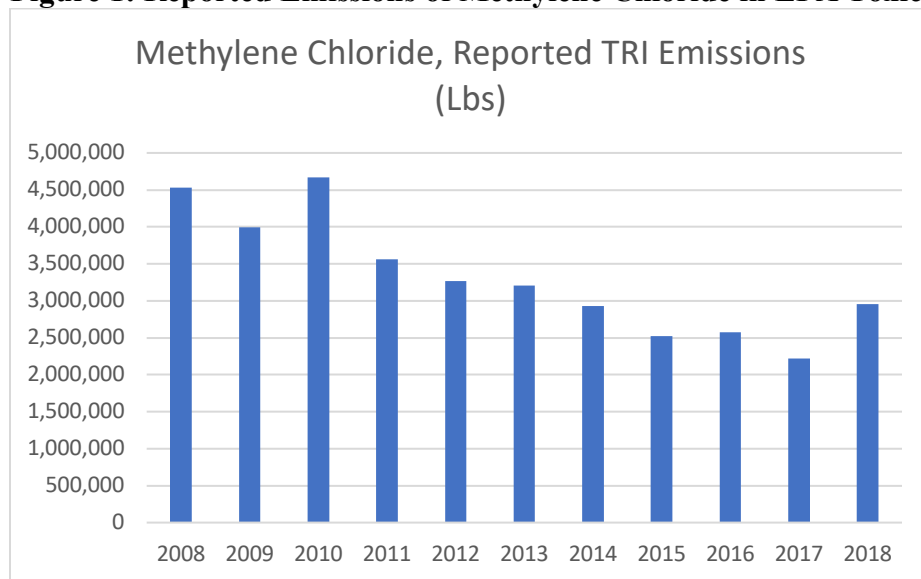


Figure 1: Reported Emissions of Methylene Chloride in EPA Toxic Release Inventory (2008-2018)



Permitted uses of methylene chloride include solvents, adhesives, coatings, blowing agents for certain foams, feedstock use for producing hydrofluorocarbons (HFCs)¹⁷ and may also be used to produce new alternative refrigerants and blowing agents, hydrofluorolefins (HFOs).¹⁸

EPA also notes methylene chloride use “[i]ncorporated into formulation, mixture, or reaction product, (however the exact use is not known or reasonable ascertainable) in the oil and gas drilling, extraction, and support activities sector.”¹⁹ A 2012 study described high levels of methylene chloride at natural gas

¹⁷ EPA, 2018 TRI Factsheet: Chemical – Dichloromethane (Nov. 12, 2019),

<https://enviro.epa.gov/triexplorer/chemical.html?pYear=2018&pLoc=000075092&pParent=TRI&pDataSet=TRIQ1>

¹⁸ Comment submitted by Halogenated Solvents Industry Alliance (2017), Methylene Chloride; TSCA Review and Risk Evaluation, DocID EPA-HQ-OPPT-2016-0742-0019, available at: <https://www.regulations.gov/document?D=EPA-HQ-OPPT-2016-0742-0019>

¹⁹ <https://www.regulations.gov/document?D=EPA-HQ-OPPT-2016-0742-0003>

drilling sites, but was unable to explain its origins.²⁰ Subsequent studies have reported similar results.²¹ EIA is supportive of EPA's finding of unreasonable risk in the oil and gas extraction sector, but also calls for further examination of this unascertained source and any potential linkage with rising atmospheric concentrations of methylene chloride. Natural gas production in the U.S. from shale gas rose six fold from 2007 to 2013.²² This is the same time period that accelerating emissions of methylene chloride have been observed in the atmosphere. Given linkages to ozone depletion and other impacts on human health, it is highly concerning that EPA has not further investigated this use and that this growing sector is not required to report releases to EPA's TRI.²³

Use of methylene chloride in foam blowing in the U.S. has been reduced because of EPA regulations under Title VI of the Clean Air Act²⁴ and foam blowing is cited in the draft risk evaluation as a minor use of methylene chloride.²⁵ EPA's 2016 rulemaking limiting use of methylene chloride in many foam blowing applications was not based on ozone depletion risks, however EPA acknowledged that:

*“Recent research indicates that emissions of methylene chloride from multiple industrial sources have been increasing and could have a detectable impact on the ozone layer, despite the historical assumption of negligible ODP.”*²⁶

As further discussed below in the section on Title VI regulations, EPA has authority to further restrict methylene chloride and other VSLs where a substance is listed as Acceptable for end-uses covered by the Significant New Alternatives Policy (SNAP) Program including for solvents, and coatings (see Appendix I). However, this Title VI authority is limited and does not cover risks from the full lifecycle of substances, intermediate uses such as feedstocks, or other end-uses in which Class I and Class II substances were not historically used.

CTC Emissions and Continued Production and Use for Feedstock

Carbon tetrachloride, or CTC, is a controlled Class I ODS under the Montreal Protocol and its associated implementation under Title VI of the Clean Air Act (“CAA”). It is not a VSL. However, its production is allowed under the Montreal Protocol and CAA as long as it is subsequently transformed into another substance such as when used as a feedstock or processing agent in production of another chemical.²⁷

²⁰ Lisa Song, Inside Climate News, “First Study of Its Kind Detects Hazardous Air Pollutants at Gas Drilling Sites” (2012). <https://insideclimatenews.org/news/20121203/natural-gas-drilling-air-pollution-fracking-colorado-methane-benzene-endocrine-health-NMHC-epa-toxic-chemicals>

²¹ Gradient Corp, Public Health Evaluation of Ambient Air Near a Shale Gas Well Site and School Campus (2019), Canonsburg PA. See also: Wendy Glauser, “New legitimacy concerns about fracking and health” (2014). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4016083/>

²² US Energy Information Administration, Gross Withdrawals from Shale Gas Wells: https://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGS_mmcf_a.htm

²³ Oil and gas extraction is not listed as a covered industry sector: <https://www.epa.gov/toxics-release-inventory-tri-program/tri-covered-industry-sectors>

²⁴ EPA-HQ-OAR-2015-0663; FRL-9952-18-OAR (2016)

²⁵ Draft risk evaluation at p40.

²⁶ EPA-HQ-OAR-2015-0663; FRL-9952-18-OAR (2016), at 270.

²⁷ 40 CFR § 82.3, Definition of “Production”

Feedstock and process agent uses are considered ‘nondispersive’. However, emissions of CTC have not declined as rapidly as expected despite being banned for all emissive uses.²⁸

Despite efforts to close a gap between larger top-down estimates of emissions derived from scientific observations and bottom-up estimates, an ongoing uncertainty gap suggests that there may still be **up to 15Gg in unexplained global CTC emissions** that could be linked to either underestimated emissions from feedstock uses, fugitive emissions from by-production or other unknown or unreported sources.²⁹ CTC remains widely used as a feedstock to manufacture hydrofluorocarbons (HFCs) and its production and use is expected to expand further to produce their replacements, unsaturated HFCs or HFOs. CTC production for these nondispersive applications globally totaled ~200 Gg in 2012-2014 based on which bottom up emissions contributions of 2Gg/year from feedstock use have been derived.³⁰

Recent use of CTC as a feedstock has also been linked to unexpected emissions of a banned ODS CFC-11 and its widespread illegal production and use in China.³¹ Scientific observations over the same time period, suggest this is also associated with observed concentrations of CTC emissions in the same region of China were the increased emissions of CFC-11 were observed.³² This strongly suggests a linkage between increased feedstock use and increased emissions, in this case, due to illegal ODS production.

Unreported CTC Emissions in the United States

Recent scientific findings suggest CTC emissions in the United States might have been grossly under-reported to the EPA’s TRI database, implying a potential connection between uses as a feedstock and these increasing unreported emissions. A 2016 study estimated annual average US emission of 4.0 (2.0–6.5) Gg during 2008–2012, which is several **orders of magnitude larger than the levels reported to TRI during the same period**, which were a mean of 0.06 Gg y⁻¹.³³ In 2016 and 2017, a 200% increase in CTC emissions above 2015 levels was reported, of up to 372,000 pounds which returned to 176,000 pounds in 2018.³⁴ Per TRI, the sudden spike in emissions reported in 2016-17 came from a facility owned by Dover Chemical Corporation a subsidiary of ICC Industries Inc, in Dover, Ohio, a producer of chlorinated alkanes, flame retardants, and other chemical products. This is the same facility where a large accidental spill of ‘chlorinated wax material’ containing CTC byproduct and chloroform occurred from a reactor in 2014 leading to concerns about EPA’s voluntary reporting program.³⁵ Reported releases have otherwise remained mostly stable over the last decade (see Figure 2), but a tripling of reported releases from a single facility combined with atmospheric evidence of higher levels calls into question the reliability and accuracy of reported releases for EPA’s risk evaluation.

²⁸ Liang, Newman, Reiman, *SPARC Report on the Mystery of Carbon Tetrachloride* (2016).

²⁹ Id at xii.

³⁰ Id.

³¹ EIA, *Blowing it: Illegal Production and Use of CFC-11 in China’s*. See also: EIA, *Tip of the Iceberg*

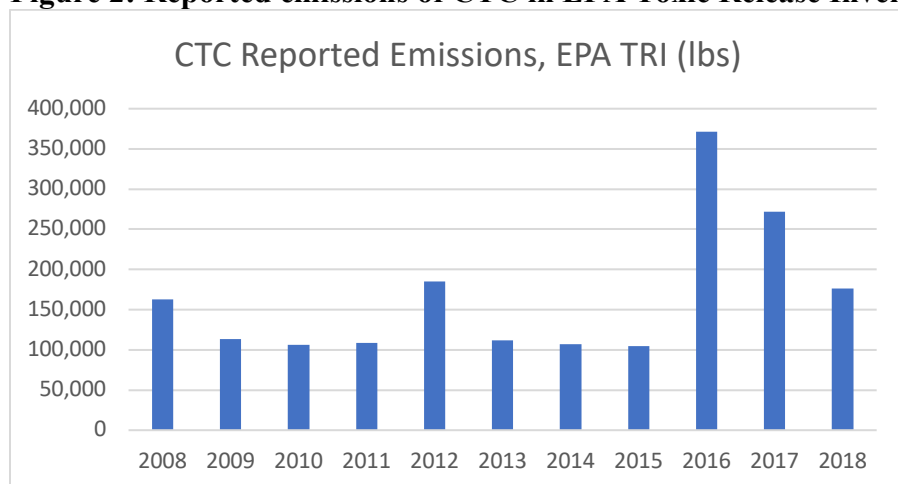
³² Lunt et al, Continued emissions of ozone depleting substance carbon tetrachloride from eastern Asia. (2018) *Geophysical Research Letters*, 45.

³³ Hu, L., Montzka, S. A., Miller, B. R., Andrews, A. E., Miller, J. B., Lehman, S. J., ... & Atlas, E. L. (2016). Continued emissions of carbon tetrachloride from the United States nearly two decades after its phaseout for dispersive uses. *Proceedings of the National Academy of Sciences*, 113(11), 2880-2885.

³⁴ EPA, 2018 TRI Reporting: Chemical – Carbon Tetrachloride (Accessed Dec 12, 2019)

³⁵ <https://www.cantonrep.com/article/20140809/NEWS/140809278>

Figure 2: Reported emissions of CTC in EPA Toxic Release Inventory (2008-2018)



Chemical manufacturers claim that feedstock uses of CTC and other chemicals are ‘highly controlled’ and non-emissive uses.³⁶ However, EPA’s scoping document for the risk evaluation of CTC acknowledges that feedstock use is the main use for CTC. The EPA must consider this glaring inconsistency between reported emissions and the scientifically observed regional emissions, when evaluating sources and risks of CTC emissions from feedstock use in the revised TSCA risk reevaluation. This should also lead EPA to approach risk assessment of other feedstock chemicals, including methylene chloride, with similar caution and concerns. EIA concerns regarding increase in use and emissions from chemical feedstocks are echoed by other environmental organizations.³⁷

Regulatory Gaps in Title VI Clean Air Act Limit Oversight of VSLS and Feedstock Use

EPA’s draft risk evaluation suggests that regulation of methylene chloride under the Clean Air Act (“CAA”) or other regulations, is adequate to assess and manage risks posed by methylene chloride to the general population.³⁸ This is not the case when considering ozone depletion risks that result from emissions due to unregulated uses of ODS such as feedstocks, or for short-lived ozone depleting chemicals not classified as “Class I” or “Class II” under Title VI of the CAA.

The EPA first regulated ODS under TSCA in 1978 due to concerns about ozone depletion, prohibiting production and importation of CFCs for non-essential propellant uses.³⁹ Subsequent to the ratification of the Montreal Protocol, CAA regulations under Title VI have been cited as reasoning for TSCA’s

³⁶ Arkema inc, “Comments to Inform EPA’s Rulemaking on the Scope of Risk Evaluations for the First Ten Chemical Substances under the Lautenberg Chemical Safety Act (LCSA)” (2017), EPA-HQ-OPPT-2016-0742-0079 ; See also: Comments of the Halogenated Solvents Industry Alliance, (2017), EPA-HQ-OPPT-2016-0742-0019; See also Comments of the Alliance for Responsible Atmospheric Policy (2017), EPA-HQ-OPPT-2016-0742-0023

³⁷ Comments submitted on behalf of Safer Chemicals, Healthy Families, Earthjustice, Natural Resources Defense Council, Environment Health Strategy Center on the initial 10 chemicals selected for risk evaluations. See <https://www.regulations.gov/document?D=EPA-HQ-OPPT-2016-0742-0073>

³⁸ Draft Methylene Chloride Risk Evaluation at p33.

³⁹ Fully Halogenated Chlorofluoroalkanes, 43 Fed. Reg. 11,318, 11,318 (Mar. 17, 1978)

assessment and control of ozone depletion risks being obsolete.⁴⁰ However, Title VI regulations only phased-out production of Class I and Class II ozone depleting substances for emissive uses, not including production for feedstock and other intermediate uses.⁴¹ Furthermore, these regulations do not cover methylene chloride and other VSLS that were not categorized as a Class I or Class II ODS due to their short-lived nature.

EPA's Significant New Alternatives Policy (SNAP) Program under Section 612 of the CAA does regulate the manufacturing of products using some VSLS substances to a limited extent. This applies only where such substances are used as alternatives to a Class I or Class II ODS for specific end-uses, such as methylene chloride which is an alternative blowing agent for CFC-11 in production of certain kinds of foams. Certain uses of methylene chloride have been restricted under the EPA's SNAP Program, such as for use in flexible foams as of 2017, but remains permitted for use in other foam applications including integral skin foams and polyolefins, and in cleaning solvents⁴² and coatings.⁴³ Appendix I to these comments references which of the chlorinated and brominated substances being evaluated under TSCA are listed as Acceptable or Unacceptable for specific end-uses under the SNAP Program. Further restriction on certain other chlorinated substances shown in Appendix I with applicable Acceptable listings through Title VI SNAP Program regulations is thus feasible. However, SNAP regulations are limited to examining comparative risks of substances within a specific end-use and do not provide comprehensive scope for assessment of overall risks of emissions from all lifecycle stages from production, uses, and disposal, as is provided for within the scope of TSCA.

Conclusions

EPA's draft risk evaluation for methylene chloride fails to assess risks posed by ozone depletion from a short-lived ODS which has been observed in rapidly increasing atmospheric concentrations. EPA must ensure that emissions of methylene chloride, CTC, and other chlorinated and brominated substances prioritized for risk evaluation (see Appendix I), do not contribute to further ozone depletion or delay full recovery of the ozone layer. TSCA has been previously utilized to address risks from ozone depletion and should at minimum, assess new concerns that are unaddressed by the limited regulatory scope of CAA Title VI. Methylene chloride, in particular, poses an increasing threat to delaying ozone recovery and may be contributing to newly observed ozone depletion in the upper troposphere and lower stratosphere over populated regions of the globe with the potential to delay full recovery of the ozone layer by up to 30 years.

Inconsistencies between emissions derived from scientifically observed concentrations in the atmosphere and reported releases of CTC suggests that the chemical manufacturing industry claim that feedstock uses are highly controlled processes that do not contribute significant emissions is not true. Particularly in the case of CTC where emissive and consumer uses have been prohibited, feedstock and other intermediate uses or improper disposal are the only known potential sources that could significantly contribute to the higher levels of scientifically observed regional emissions. The recent connection of lack of controls on

⁴⁰ <http://www.complywithtsca.com/tscaonline/pdfs/vol3/chapterC/ChCdoc1.pdf>

⁴¹ See EPA, <https://www.epa.gov/ods-phaseout/accelerated-phaseout-class-i-ozone-depleting-substances>

⁴² <https://www.epa.gov/snap/substitutes-cleaning-solvents>

⁴³ <https://www.epa.gov/snap/substitutes-coatings>

CTC feedstock contributing to illegal production and use of CFC-11, even if outside United States, is further cause for alarm. It is imperative that risks posed by feedstock uses of methylene chloride, CTC, and other substances for fluorochemical production be assessed and limited where necessary to prevent continued trends of increasing emissions. Finally, EIA supports EPA’s finding of unreasonable risk of methylene chloride in the oil and gas extraction sector and urges EPA to further investigate and require reporting of emissions from this sector as well.

Respectfully Submitted,

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Appendix I: Chlorinated and Brominated Substances Prioritized for Risk Evaluation under Amended TSCA Covered by EIA Comments

	EPA TRI 2018 Releases to Air (lb)⁴⁴	Regulated under CAA Section 612 (SNAP Program)⁴⁵	Known Feedstock Uses
Methylene Chloride	2,957,712	Yes, acceptable for solvents, integral skin foams, polyolefins, adhesives, coating, inks; Unacceptable in flexible foams	Feedstock for HFC-32 ⁴⁶ and HFOs ⁴⁷
Carbon Tetrachloride	176,049	No	Feedstock for perchloroethylene, HFCs, and CFCs ⁴⁸
p-dichlorobenzene	25,906	No	None known to EIA.
1,2-Dichloroethane	446,480	No	Feedstock for CTC, trichloroethylene, Methyl Chloroform ⁴⁹
Trans-1,2-Dichloroethylene	3,786 ⁵⁰	Yes, acceptable for aerosol solvents, adhesives, coating, inks	None known to EIA.
o-Dichlorobenzene	28,046	No	None known to EIA.

⁴⁴ Search EPA’s TRI Database [here](#).

⁴⁵ See SNAP Substitutes by Sector: <https://www.epa.gov/snap/snap-substitutes-sector>

⁴⁶ See p29: https://www.epa.gov/sites/production/files/2017-06/documents/mecl_scope_06-22-17.pdf

⁴⁷ Comment submitted by Halogenated Solvents Industry Alliance (2017), Methylene Chloride;TSCA Review and Risk Evaluation, DocID EPA-HQ-OPPT-2016-0742-0019, available at: <https://www.regulations.gov/document?D=EPA-HQ-OPPT-2016-0742-0019>

⁴⁸ See p24 & p26: https://ec.europa.eu/clima/sites/clima/files/ozone/docs/feedstock_en.pdf

⁴⁹ Ibid, See p41; See p38: https://archive.epa.gov/epawaste/hazard/web/pdf/final_lb.pdf

⁵⁰ Self-calculated 40% of reported TRI emissions of 1,2-dichloroethylene. See Earthjustice’s 156-60-6 Trans-1,2-Dichloroethylene: Technical Report on the Conditions and Use p1.

1,1,2-Trichloroethane	46,291	No	Feedstock for 1,1-dichloroethane ⁵¹
1,2-Dichloropropane	16,725	No	Feedstock for perchloroethylene, tetrachloroethylene, CTC ⁵²
1,1-Dichloroethane	9,146	No	Feedstock for Methyl Chloroform ⁵³
Tris(2-chloroethyl) phosphate (TCEP)	N/A	No	None known to EIA.
Ethylene Dibromide	N/A	No	None known to EIA.
Perchloroethylene	910,855	Yes, acceptable for adhesives, coating, inks	Feedstock for HFC, HCFC, & CFCs ⁵⁴
Trichloroethylene	1,920,729	Yes, acceptable for adhesives, coating, inks	Feedstock for HFC-134a ⁵⁵
1-Bromopropane	776,294	No	None known to EIA.

⁵¹ See p1.: https://www.dec.ny.gov/docs/air_pdf/albsouthendapp.pdf

⁵² Ibid, See p4.

⁵³ <https://pubchem.ncbi.nlm.nih.gov/compound/1%2C1-dichloroethane>

⁵⁴ See p107: https://www.epa.gov/sites/production/files/2018-06/documents/perc_problem_formulation_5-31-2018v3.pdf

⁵⁵ See p10: https://www.epa.gov/sites/production/files/2018-06/documents/tce_problem_formulation_05-31-31.pdf