

MEMORANDUM

TO: Docket for rulemaking, “Review of National Emission Standards for Hazardous Air Pollutants: Polyether Polyols Production” (EPA-HQ-OAR-2023-0282)

DATE: March 2026

SUBJECT: Economic Impact Analysis for the Review of the National Emission Standards for Hazardous Air Pollutants for the Polyether Polyols Production Industry – Final Rule

1. Introduction

This Economic Impact Analysis (EIA) describes the potential economic impacts of the U.S. Environmental Protection Agency’s (EPA) final technology review of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for major sources of hazardous air pollutants (HAP) in the Polyether Polyols (PEPO) Production source category, 40 CFR part 63, Subpart PPP. The PEPO Production source category includes any facility that produces PEPO. The PEPO NESHAP regulates emissions from polyether polyol manufacturing process units (PMPUs) that produce PEPO as its primary product.¹ This final action does not meet the criteria of a significant regulatory action under section 3(f)(1) of Executive Order 12866 because it is not likely to have an annual effect on the economy of \$100 million or more nor adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities.

The HAP emission sources at PEPO facilities include process vents, storage vessels, equipment leaks, and wastewater. Additionally, some facilities have cooling towers or other heat exchangers. In the production of PEPO, HAPs are used primarily as reactants or extraction solvents. The MACT standards for PEPO production include emission limits for process vents; a combination of equipment standards and work practices for storage vessels, wastewater, and equipment leaks; and work practice standards for heat exchange systems.

The EPA is finalizing requirements resulting from the Agency’s technology review of the PEPO NESHAP, including specific standards for ethylene oxide (EtO) emissions, and decisions based on its reconsideration of certain issues raised in an administrative petition for reconsideration. Lastly, the EPA is finalizing the addition of work practice standards for certain

¹ A PMPU also includes flexible operation process units when an owner or operator cannot determine that a PEPO is not the primary product and a PEPO is produced or anticipated to be produced during time spans described in 40 CFR 63.1420(e)(2).

activities where alternatives or clarification are appropriate and to update provisions for electronic reporting and performance testing.

As part of fulfilling the analytical guidance with respect to E.O. 12866, the EPA presents the estimates of the present value (PV) of the incremental regulatory compliance costs over the 20-year period from 2026 to 2045. To calculate the PV, the annual flow of compliance costs are discounted to 2026. The choice of social discount rates reflects the guidance of OMB Circular A-4, which suggests a 3 percent rate to represent the social rate of time preference (i.e., the rate at which society discounts future consumption) and a 7 percent rate to represent the opportunity cost of capital.² The discounted annual values are then summed over the 20-year period to calculate the PV. The EPA also presents the EAV, which represents a flow of constant annual values that, had they occurred in each year from 2026 to 2045, would yield a sum equivalent to the PV.

Table 1. Social Cost Estimates, 2026 to 2045 (millions 2024\$)

	3 Percent Discount Rate	7 Percent Discount Rate
PV	\$136	\$108
EAV	\$9.16	\$10.2
PV (with Product Recovery)	\$135	\$107
EAV (with Product Recovery)	\$9.10	\$10.1

Note: Values have been rounded to three significant figures.

As shown in Table 1, the present value PV of the estimated compliance costs from 2026 to 2045 for the final rule is \$136 million in 2024 dollars, discounted at a 3 percent rate. The EAV of the estimated costs is \$9.16 million, using a 3 percent discount rate. Using a 7 percent discount rate, the PV and EAV of the costs are estimated to be \$108 million and \$10.2 million, respectively. With product recovery and discounting at 3 percent, the PV is estimated at \$135 million with an estimated EAV of \$9.10 million. Certain control options analyzed in this rulemaking potentially lead to chemical product recovery, which has been monetized as product recovery credits that can offset regulatory costs. With product recovery and discounting at 7 percent, the PV is estimated at \$107 million with an estimated EAV of \$10.1 million.

² OMB. *Circular No. A-4*. September 17, 2003. <https://www.whitehouse.gov/wp-content/uploads/2025/08/CircularA-4.pdf>. Accessed 10/1/2025.

This rule is estimated reduce HAP and VOC emissions from PEPO production sources by approximately 97 and 130 tons per year (tpy), respectively. The EPA estimates the EtO-specific standards will result in an approximate 12 tpy reduction in EtO emissions. The potential health impacts associated with reduced exposure to the emissions addressed by this final rule were not quantified or monetized due to methodological and data limitations.

We anticipate that this final rulemaking may affect requirements for a total of 23 PEPO production facilities (owned by 16 ultimate parent companies). Of the 16 affected ultimate parent entities, 1 is a small entity. As detailed later in this EIA, the Agency has determined that this action will not have a significant economic impact on a substantial number of small entities (SISNOSE) under the Regulatory Flexibility Act.

This EIA is organized as follows. Section 2 provides an overview of the PEPO production industry. Regulatory background is provided in Section 3. Section 4 presents the cost and emissions analyses and discusses potential economic impacts at the market and firm levels.

2. Industry Overview

PEPO are a class of organic chemicals that contain multiple ether linkages (known as polyether) formed in a polymerization process of cyclic ethers such as ethylene oxide, propylene oxide, or tetrahydrofuran, with compounds that have one or more hydroxyl groups as terminal functional groups (monols or polyols) such as sorbitol or triethanolamine. Depending on the chosen combination of cyclic ether and polyol reactants, manufacturers can achieve different molecular weights and chemical properties. Typically, the reaction is carried out by discontinuous batch processes at elevated pressures and temperatures under an inert atmosphere. PEPO typically do not have significant uses of their own and are used in making other products such as surfactants, surface coatings, lubricants, adhesives, sealants, cosmetics, pharmaceuticals, and feedstock polymers for polyurethane production.

Production of materials regulated as glycols or glycol ethers under the Hazardous Organic NESHAP (HON) is excluded from the source category. PEPO production can result in the emissions of HAP, including, but not limited to, EtO, propylene oxide, hexane, toluene, and methanol. While there may be variation in PEPO production stages, this NESHAP includes requirements to control HAP emissions from the following: storage vessels, process vents,

equipment leaks, waste operations and associated ancillary equipment such as heat exchange systems.

The PEPO market is generally an intermediate product in the plastics material and resin manufacturing supply chain that is consumed by other manufacturers for different end uses. The market is segmented by type and properties; these include flexible or rigid types for certain foam applications and other PEPO types for applications in coatings, adhesives, sealants, and elastomers. These applications fall into end-user industries like automotive, construction, electrical and electronics, furniture and bedding, and other industries. The global PEPO market has a projected compound annual growth rate of over 5 percent from 2019 to 2030, with the Asia-Pacific region being the largest and fastest growing market.³

The affected facilities of this NESHAP are geographically concentrated in the southern U.S. with most located in Texas (6), Louisiana (6), and West Virginia (6). We characterized affected firms using a North American Industrial Classification System (NAICS) code. PEPO industries are a part of the chemical manufacturing sector (NAICS 325) and serve as a feedstock for other chemical manufacturing subsectors. Among the identified facilities, there are three unique NAICS codes represented in the associated NESHAP and the U.S. economy. Table 2 provides 2017 data on total annual revenues and employment for these entire industries directly related to PEPO production in the US economy, not only facilities directly impacted by this rulemaking.^{4 5}

Table 2: Polyether Polyols Industries

NAICS	Name of Industry	Number of Firms	Total Revenue in 2017 (in Billions)	Total Employment in 2017
325110	Petrochemical Manufacturing	27	\$54.24	9,355
325199	All other basic organic chemical manufacturing	614	\$77.19	62,873
325998	All other miscellaneous chemical product and preparation manufacturing	1,081	\$22.14	36,412

³ Modor Intelligence (2023). *Polyether Polyol Market Size & Share Analysis - Growth Trends & Forecasts (2023 - 2028)*. <https://www.mordorintelligence.com/industry-reports/polyether-polyol-market>. Accessed 8/7/2025.

⁴ Information on facility-level NAICS code was collected from D&B Hoover's. Retrieved from <https://app.dnbhoovers.com/>.

⁵ Data available at: <https://data.census.gov/table?q=EC1700SIZEREVEREST&n=325110:325199:325998>. Accessed 10/15/2025.

Table 3 presents changes in producer price indices for commodities related to PEPO production and related commodities from 2013 to 2024.⁶ As described earlier in this section, PEPO is generally an intermediary product, so included products may not be directly produced by PEPO facilities.

Note that, besides a significant volatility in the petrochemical manufacturing industry producer price index, PEPO industries and product prices have remained relatively stable in prices except in recent years. All industry and product categories saw low to negative growth in 2020, largely resulting from supply and demand constraints caused by the Covid-19 pandemic.

Overall prices rebounded between 2021 and 2022, with most PEPO industry and product categories seeing their highest single-year spike in prices in 2022— while “Petrochemical Manufacturing” saw most of their increase in the previous year. This economy-wide increase indicates recovering market conditions for PEPO manufacturing and industries that use PEPO products as inputs. On the demand-side, Covid-19-related lockdowns increased the demand for delivered goods and therefore greater plastic packaging, while the healthcare industry increased demand for plastics related to personal protective equipment (PPE). Supply-side issues also constrained the availability of plastics and resins due to related labor shortages or production slowdowns, as well as more widespread international supply chain difficulties.⁷

⁶ Changes in prices are tracked by the Producer Price Index (PPI) program which measures the average change over time in the selling prices received by domestic producers for their output. More information on the PPI program is available at: <https://www.bls.gov/ppi/overview.htm>. Accessed 8/11/2025.

⁷ Pederson, Jacki (July 2021). Summit Packaging. *Plastic Resin Prices 2021–Resin Shortage & Cost of Plastic Explained*. <https://summitpackaging.com/plastic-resin-prices-2021-resin-shortage/>. Accessed 8/11/2025.

Table 3: Producer Price Index of Polyether Polyol Industries and Related Products, 2013-2024 (2013 = 100)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2013-2024
All Other Basic Organic Chemical Manufacturing	100.0	99.9	97.4	95.4	103.3	109.3	104.3	99.6	112.9	134.4	130.5	123.4	
YoY Change		-0.1	-2.5	-2.0	7.9	6.0	-5.1	-4.7	13.3	21.5	-3.9	-7.1	23.4
% YoY Change		-0.1%	-2.5%	-2.0%	8.3%	5.8%	-4.6%	-4.5%	13.4%	19.1%	-2.9%	-5.4%	23.4%
Paint, Coating, and Adhesive Manufacturing	100.0	101.0	100.0	99.5	100.8	104.2	108.2	109.9	117.8	143.5	150.0	149.9	
YoY Change		1.0	-0.9	-0.6	1.3	3.4	4.0	1.7	8.0	25.7	6.5	-0.1	49.9
% YoY Change		1.0%	-0.9%	-0.6%	1.3%	3.4%	3.8%	1.6%	7.3%	21.8%	4.5%	-0.1%	49.9%
Petrochemical Manufacturing	100.0	92.1	57.5	51.8	59.4	65.2	58.2	46.6	83.3	89.1	68.8	71.1	
YoY Change		-7.9	-34.6	-5.7	7.6	5.8	-7.0	-11.6	36.6	5.8	-20.3	2.3	-28.9
% YoY Change		-7.9%	-37.5%	-9.8%	14.7%	9.7%	-10.7%	-19.9%	78.6%	7.0%	-22.8%	3.3%	-28.9%
Polyurethane and Other Foam	100.0	103.8	104.9	104.4	106.1	110.9	109.9	108.3	117.6	131.7	129.7	127.6	
YoY Change		3.8	1.1	-0.4	1.6	4.9	-1.1	-1.5	9.2	14.1	-2.0	-2.1	27.6
% YoY Change		3.8%	1.0%	-0.4%	1.6%	4.6%	-1.0%	-1.4%	8.5%	12.0%	-1.5%	-1.6%	27.6%
Surfactants	100.0	105.1	104.8	105.4	112.8	116.6	110.8	108.1	121.9	140.4	145.1	146.4	
YoY Change		5.1	-0.3	0.6	7.4	3.8	-5.8	-2.6	13.7	18.5	4.8	1.3	46.4
% YoY Change		5.1%	-0.3%	0.6%	7.0%	3.4%	-5.0%	-2.4%	12.7%	15.2%	3.4%	0.9%	46.4%

Note: “Year over year” is being acronymized as “YoY”. Values are annual averages, indexed from January 1, 2013.

Source: Federal Reserve Economic Data, Economic Research Division, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/PCU325199325199P>, <https://fred.stlouisfed.org/series/PCU32553255>, <https://fred.stlouisfed.org/series/PCU3251132511>, <https://fred.stlouisfed.org/series/PCU326150326150>, <https://fred.stlouisfed.org/series/WPU06790502>.

3. Regulatory Background

NESHAPs establish technology-based standards based on Maximum Achievable Control Technology (MACT) for major sources of HAP emissions for source categories which emit one or more of the HAP listed in CAA 112(b). The term “major source” means any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit, considering controls, 10 tons per year or more of any single HAP or 25 tons per year or more of any combination of HAPs. MACT standards are based on emissions levels that are already being achieved by the best-controlled and lowest-emitting sources in a source category.⁸ The EPA then evaluates the MACT standards to determine whether additional standards are needed to address any remaining risk associated with HAP emissions. The EPA also examines more stringent “beyond-the-floor” (BTF) regulatory options to determine if additional controls beyond those required to meet the MACT floor are reasonable for a source category after considering cost, feasibility, energy requirements, and non-air quality health and environmental impacts.

The EPA conducts RTRs eight years after a NESHAP is established for a source category. Technology reviews are then conducted every eight years after that. The technology review assesses developments in practices, processes, or control technologies and revises the standards as necessary, considering factors like cost and cost-effectiveness. The residual risk review first identifies whether additional standards beyond the technology-based standards are needed to reduce risk to acceptable levels (without considering costs).⁹ The EPA then assesses whether even more stringent standards are needed to protect public health with an ample margin of safety or to prevent adverse environmental effects after considering relevant factors such as cost and feasibility. The EPA is also required to address regulatory gaps through RTRs, such as

⁸ The term “MACT floor” refers to the minimum control technology on which MACT standards can be based. The MACT floor is set by the average emissions limitation achieved by the best performing 12 percent of existing sources in a category when the category contains at least 30 sources. When fewer than 30 sources exist in the source category being regulated, the floor is based on the emission limitations achieved by the 5 best performing sources.

⁹ The risk assessment provides estimates of the maximum individual risk (MIR) for cancer posed by the HAP emissions from each source in the source category, the hazard index (HI) for chronic exposures to HAP with the potential to cause noncancer health effects, and the (hazard quotient) HQ for acute exposures to HAP with the potential to cause noncancer health effects. The risk assessment also provides estimates of the distribution of cancer risk within the exposed populations, cancer incidence, and an evaluation of the potential for an adverse environmental effect.

missing standards for HAPs known to be emitted from the source category (*Louisiana Environmental Action Network (LEAN) v. EPA*, 955 F.3d 1088 (D.C. Cir. 2020)).

The EPA conducted an RTR for the PEPO NESHAP in 2014, concluding that there was no need to revise the PEPO NESHAP under the provisions of either CAA section 112(f) or (d)(6) (see 79 FR 17340, March 27, 2014). As part of the residual risk review, the EPA conducted a risk assessment, and based on the results of the risk assessment, determined that the then current level of control called for by the existing MACT standards both reduced HAP emissions to levels that presented an acceptable level of risk and provided an ample margin of safety to protect public health.

4. Cost, Emissions, and Economic Impact Analysis

In the cost memoranda for each control option and requirement, the EPA summarizes the methodology used and the results of estimating the cost and the environmental impacts, such as the emission changes, associated with the finalized changes to the NESHAP for existing or new major sources in the PEPO production source category (40 CFR part 63, Subpart PPP). The cost memoranda also discuss the resources and methods used to estimate the capital and annual costs per facility and the environmental impacts. As described in the cost memoranda, affected facilities are expected to incur compliance costs related to the final requirements for flares, process vents, storage vessels, maintenance vents, heat exchange systems, equipment leaks, and wastewater.¹⁰ The cost memoranda for each control or requirement of this rule can be found in the docket.

In this EIA, we evaluate the potential economic impacts associated with the final rule in the aggregate as well as at the ultimate parent company level.¹¹ We selected the 2026 to 2045 period to assess the economic effects of this action. This period spans the period from when the NESHAP takes effect through the lifetime of the typical capital equipment (20 years) expected to

¹⁰ The final rulemaking does not include revisions to the standards for continuous process vents and does not establish a fence-line monitoring work practice standard, unlike the proposed rulemaking.

¹¹ Further details can be found in *PEPO NESHAP Final EIA Economic Calculations.xlsx*, which is a spreadsheet that documents facility-level and ultimate parent company-level economic impact estimates developed for this economic impact analysis. This spreadsheet was generated by U.S. EPA and can be found in the docket for this rulemaking. Calculations for annualized costs of individual rule requirements are in their respective cost memoranda found in the docket.

be installed as a result of the final NESHAP. “Total annual costs” include annual costs such as operating and maintenance costs plus annualized capital costs, which are estimated using a capital recovery factor based on the prevailing interest rate and the lifetime of the capital equipment.

Additionally, certain control options analyzed in this rulemaking potentially lead to chemical product recovery. These recovered chemical products are monetized in this analysis as recovery credits by multiplying VOC emissions reductions by a VOC credit of \$900 per ton (2024 dollars). Net compliance costs are calculated as total compliance costs minus product recovery credits.

4.1. Private Cost Analysis

Table 4 below presents a summary of the private costs estimated to be borne by affected facilities under the final rule by emission point and in total. Capital and total annual costs are shown, and total annual costs are shown with and without product recovery. The effect of product recovery on the total annual costs is small, as shown in the table. The total capital investment of the final rule is about \$28 million, and the total annual cost is about \$9.9 million without product recovery and \$9.8 million with product recovery in 2024 dollars. The estimation of total capital cost (i.e., total capital investment) and total annual cost follows the methodology in the EPA Air Pollution Control Cost Manual.¹² Estimates of total annual costs include both operating and maintenance and annualized capital costs (based upon application of the assumed capital recovery factor). The inclusion of product recovery reduces the total annual cost by only 0.65 percent (about \$64,000, as shown in the table).

¹² EPA Control Cost Manual, Seventh Edition (November 2023). Retrieved from <https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution>. Accessed 8/7/2025.

Table 4: Detailed Costs for the PEPO Source Category by Emission Point for the Final Rule (2024\$)

Emission Point	Total Capital Cost (\$)	Total Annual Cost (\$/yr) Without Recovery Credits	Total Annual Cost (\$/yr) With Recovery Credits	Annual Recovery Credits (\$/yr)
Flares	\$8,800,000	\$2,000,000	\$2,000,000	\$0
Storage Vessels - Degassing	\$0	\$54,000	\$54,000	\$0
Storage Vessels - Pressure Vessels	\$3,700	\$3,500	\$3,500	\$0
Storage Vessels - 240hr Maintenance	\$20,000	\$4,100	\$4,100	\$0
Maintenance (Equipment Openings)	\$0	\$11,000	\$11,000	\$0
Heat Exchange Systems	\$250,000	\$120,000	\$80,000	\$38,000
Equipment Leaks	\$140,000	\$550,000	\$520,000	\$26,000
Process Vents and Storage Vessels	\$5,000,000	\$2,000,000	\$2,000,000	\$0
Wastewater	\$14,000,000	\$5,200,000	\$5,200,000	\$0
Total	\$28,000,000	\$9,900,000	\$9,800,000	\$64,000

Note: All estimates are rounded to two significant figures. Rows may not appear to add correctly due to rounding.

4.2. Emissions Impact Analysis

This rule is estimated to reduce HAP and VOC emissions from PEPO production sources by approximately 97 and 130 tons per year (tpy), respectively. The EPA estimates these reductions include an approximate 12 tpy reduction in EtO emissions.

Quantifying the potential effects and estimating the economic value of reducing the risk of cancer and non-cancer effects is made difficult by the lack of a central estimate of estimate of cancer and non-cancer risk and estimates of the value of an avoided case of cancer (fatal and non-fatal) and morbidity effects. Due to these methodology and data limitations, we did not attempt estimate the potential health impacts associated with reduced exposure to HAP due to the emissions reductions projected under this rule.

The EPA also estimates that the final action would result in changes in secondary emissions associated with operating the control equipment required by this final rule, including increases in emissions of several pollutants such as carbon monoxide (CO), carbon dioxide (CO₂), and particulate matter (PM_{2.5}). Table 5 presents the estimated changes in secondary emissions.

Table 5: Secondary Emission Change Estimates (Increases or Reductions) Other Than HAPs and VOCs

Pollutant	Tons per Year
CO	83
CO ₂	138,800
CH ₄	(998)
N ₂ O	2.3
NO _x	101
PM _{2.5}	7.5
SO ₂	0.59

Note: A parenthesis denotes emissions reductions.

4.3. Social Cost Analysis

To analyze the economic impacts of these requirements, certain assumptions about control technologies were made to accurately reflect how capital costs on the PEPO industry are incurred based on when they are expected to be replaced. As shown in the Table 6 and 7 below, the capital costs are experienced at different years after the rule effective date corresponding to the expected useful life of control technologies. All control technologies will incur capital costs in year one. After year one, activated carbon canisters, used to comply with the work practice for planned maintenance on storage vessel controls, are expected to be replaced every subsequent eight years, and the stripping column and FID analyzer required to monitor heat exchange systems are expected to be replaced every subsequent five years. Capital related to the equipment leaks requirement is considered a one-time initial cost, so they are only incurred in year one. Annual operating and maintenance costs are assumed to be equivalent each year.

Table 6 presents the undiscounted stream of costs without and with the product recovery, which is a very small percentage of the costs for the final rule (less than 1 percent of the total annual costs). This table also shows the PV and the EAV of the stream of costs discounted to 2026 in 2024 dollars, using a three percent discount rate.¹³ The estimated PV of the compliance costs over the 20-year period from 2026 to 2045 is estimated at \$136 million with an estimated

¹³ Present value and equivalent annualized value calculations can be found in *PEPO NESHAP Final EIA Economic Calculations.xlsx*, a spreadsheet that includes the basis for the economic impacts that was generated by US EPA for this analysis report. This spreadsheet can be found in the docket for this rulemaking.

EAV of \$9.16 million without product recovery. With product recovery, the PV is estimated at about \$135 million with an estimated EAV of \$9.10 million. The overall difference caused by product recovery is relatively minor, at less than a one percent decrease in both the PV and EAV.

Table 6: Present-Value (PV) and Equivalent Annualized Value (EAV) of Costs, at 3 Percent Discounting, 2026 to 2045 (Millions of 2024\$, Discounted to 2026)

Year	Capital Costs	Annual O&M Cost (Without Recovery Credits)	Recovery Credits	Total Annual Cost (With Recovery Credits)	Discounted stream of costs (3%)	Discounted stream of costs (With Recovery Credits) (3%)
2026	\$28	\$7.0	\$0.06	\$35	\$35	\$35
2027	\$0	\$7.0	\$0.06	\$7.0	\$6.8	\$6.8
2028	\$0	\$7.0	\$0.06	\$7.0	\$6.6	\$6.6
2029	\$0	\$7.0	\$0.06	\$7.0	\$6.4	\$6.4
2030	\$0	\$7.0	\$0.06	\$7.0	\$6.3	\$6.2
2031	\$0.25	\$7.0	\$0.06	\$7.2	\$6.3	\$6.2
2032	\$0	\$7.0	\$0.06	\$7.0	\$5.9	\$5.8
2033	\$0	\$7.0	\$0.06	\$7.0	\$5.7	\$5.7
2034	\$0.02	\$7.0	\$0.06	\$7.0	\$5.6	\$5.5
2035	\$0	\$7.0	\$0.06	\$7.0	\$5.4	\$5.3
2036	\$0.25	\$7.0	\$0.06	\$7.2	\$5.4	\$5.4
2037	\$0	\$7.0	\$0.06	\$7.0	\$5.1	\$5.0
2038	\$0	\$7.0	\$0.06	\$7.0	\$4.9	\$4.9
2039	\$0	\$7.0	\$0.06	\$7.0	\$4.8	\$4.8
2040	\$0	\$7.0	\$0.06	\$7.0	\$4.7	\$4.6
2041	\$0.25	\$7.0	\$0.06	\$7.2	\$4.7	\$4.6
2042	\$0.02	\$7.0	\$0.06	\$7.0	\$4.4	\$4.4
2043	\$0	\$7.0	\$0.06	\$7.0	\$4.3	\$4.2
2044	\$0	\$7.0	\$0.06	\$7.0	\$4.1	\$4.1
2040	\$0	\$7.0	\$0.06	\$7.0	\$4.0	\$4.0
Present Value					\$136	\$135
Equivalent Annualized Value					\$9.16	\$9.10

Note: (1) All estimates are rounded to two significant figures except PV and EAV values which are rounded to three significant figures to show a difference in values; (2) Rows may not appear to add correctly due to rounding.

Similarly, Table 7 also presents the stream of undiscounted and discounted costs of the final rule, without and with product recovery. This table uses a seven percent discount rate for PVs and the EAVs of the stream of costs discounted to 2026 in 2024 dollars.¹⁴ The estimated PV of the compliance costs over the 20-year period from 2026 to 2045 is estimated at \$108 million

¹⁴ Ibid.

with an estimated EAV of \$10.2 million without product recovery. With product recovery, the PV is estimated at about \$107 million with an estimated EAV of \$10.1 million. The overall difference caused by product recovery is relatively minor, at less than a one percent decrease in both the PV and EAV.

Table 7: Present-Value (PV) and Equivalent Annualized Value (EAV) of Costs, at 7 Percent Discounting, 2026 to 2045 (Millions of 2024\$, Discounted to 2026)

Year	Capital Costs	Annual O&M Cost (Without Recovery Credits)	Recovery Credits	Total Annual Cost (With Recovery Credits)	Discounted stream of costs (7%)	Discounted stream of costs (With Recovery Credits) (7%)
2026	\$28	\$7.0	\$0.06	\$35	\$35	\$35
2027	\$0	\$7.0	\$0.06	\$7.0	\$6.6	\$6.5
2028	\$0	\$7.0	\$0.06	\$7.0	\$6.2	\$6.1
2029	\$0	\$7.0	\$0.06	\$7.0	\$5.7	\$5.7
2030	\$0	\$7.0	\$0.06	\$7.0	\$5.4	\$5.3
2031	\$0.25	\$7.0	\$0.06	\$7.2	\$5.2	\$5.2
2032	\$0	\$7.0	\$0.06	\$7.0	\$4.7	\$4.7
2033	\$0	\$7.0	\$0.06	\$7.0	\$4.4	\$4.3
2034	\$0.02	\$7.0	\$0.06	\$7.0	\$4.1	\$4.1
2035	\$0	\$7.0	\$0.06	\$7.0	\$3.8	\$3.8
2036	\$0.25	\$7.0	\$0.06	\$7.2	\$3.7	\$3.7
2037	\$0	\$7.0	\$0.06	\$7.0	\$3.3	\$3.3
2038	\$0	\$7.0	\$0.06	\$7.0	\$3.1	\$3.1
2039	\$0	\$7.0	\$0.06	\$7.0	\$2.9	\$4.1
2040	\$0	\$7.0	\$0.06	\$7.0	\$2.7	\$3.8
2041	\$0.25	\$7.0	\$0.06	\$7.2	\$2.6	\$3.7
2042	\$0.02	\$7.0	\$0.06	\$7.0	\$2.4	\$3.3
2043	\$0	\$7.0	\$0.06	\$7.0	\$2.2	\$3.1
2044	\$0	\$7.0	\$0.06	\$7.0	\$2.1	\$2.9
2040	\$0	\$7.0	\$0.06	\$7.0	\$2.0	\$1.9
				Present Value	\$108	\$107
				Equivalent Annualized Value	\$10.2	\$10.1

Note: (1) All estimates are rounded to two significant figures except PV and EAV values which are rounded to three significant figures to show a difference in values; (2) Rows may not appear to add correctly due to rounding.

4.4. Small Entity Screening and Economic Impact Analysis

The EPA performed a screening analysis to assess potential impacts of this action on small entities. Based on the small entity size standards defined by the U.S. Small Business

Administration (SBA),¹⁵ the EPA determined that 1 of the 23 facilities affected by this action is ultimately owned by a parent company that is a small entity. This small entity is not expected to incur significant impacts based on the methodology described below. Therefore, the EPA has determined that this rule will not have a significant impact on a substantial number of small entities (*i.e.*, no SISNOSE).

To conduct a small entity screening, the EPA first identifies the ultimate parent companies of affected facilities, and obtains those companies' most recent annual revenue figures, number of employees, and North American Industrial Classification System (NAICS) code using the Dun & Bradstreet Hoover's online database.¹⁶ SBA size standards are defined for each NAICS code based on either annual revenues or employees. To determine whether an entity is small, the EPA identifies the size standard corresponding to the ultimate parent company NAICS code and determines whether the ultimate parent company is a small entity based on its annual revenues or employees. This screening determined that there are 16 total ultimate parent companies that own the facilities affected by this final rule. The facility identified as being owned by a small entity is owned by Altivia and is classified under NAICS 325199 (All Other Basic Organic Chemical Manufacturing). Entities in NAICS 325199 are considered small if they have 1,250 or fewer employees.

To assess potential impacts on small entities, the EPA calculates cost-to-sales ratios, which compare facility-level annualized compliance costs to annual sales revenues of the ultimate parent company. This metric for evaluating impacts is known as the "sales test" and is consistent with guidance published by the SBA's Office of Advocacy.¹⁷ The costs-to-sales ratio for Altivia is approximately 0.92 percent when examining the total annual costs for its facility both with and without product recovery compared to the company's annual revenues of about \$114 million in 2024 dollars. Therefore, the EPA concludes that the final action will not have a significant economic impact on a substantial number of small entities.

¹⁵ U.S. SBA. (2025). Table of size standards. Found at: <https://www.sba.gov/document/support-table-size-standards>.

¹⁶ Dun & Bradstreet, Inc. (2025). D&B Hoovers. Retrieved from <https://app.dnbhoovers.com/>. Accessed 10/2/2025.

¹⁷ U.S. SBA, Office of Advocacy. (2017). A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act. Retrieved from <https://advocacy.sba.gov/2017/08/31/a-guide-for-government-agencies-how-to-comply-with-the-regulatory-flexibility-act/>.

The mean economic impact associated with the estimated total annual cost of the final rule as a percent of annual sales for all other parent companies that own one or more affected facilities in the source category is less than 0.06 percent and thus this final rule is not expected to result in market impacts, regardless of whether it is fully passed on to the consumer or fully absorbed by the affected firms.¹⁸ We also expect minimal to no impacts on employment.

5. Uncertainties

The cost and emissions estimates presented in this EIA are subject to several sources of uncertainty. This analysis includes many data sources as inputs, including source counts, equipment and labor costs, and assumptions regarding the current state of the PEPO industry and how individual facilities carry out their operations, the future state of the industry, and the future state of the world (e.g., regulations, technology, economic activity, and human behavior). There is also uncertainty about the specific components of the engineering costs, such as the costs of the equipment and labor required to comply with the rule and how the costs might change over time. Facilities may comply with the requirements through alternative methods that were not accounted for in the cost memo. Each of the inputs and assumptions used is uncertain to some degree and generates uncertainty in the overall cost estimates. When the uncertainties from each stage of the analysis are compounded, even small uncertainties can have large effects on the total cost estimates.

The requirements of this final action may not impact all PEPO facilities equally, in part due to differences in state and local policies. In addition, the baseline may not reflect all voluntary actions firms may take to reduce EtO emissions. By not fully accounting for state and local requirements and voluntary actions in the baseline, this analysis may overestimate the costs of the rule.

Additionally, the total number of facilities subject to the action could change. The EPA estimated costs for existing facilities, but other new facilities may be constructed and become subject to the requirements. Facilities may modify or upgrade in ways that affect the number of the various emissions points impacted by this rule. They may alter their EtO usage and thus

¹⁸ Impact estimates for each affected ultimate parent company can be found in *PEPO NESHAP Final Small Business Analysis.xlsx*, a spreadsheet that includes the basis for the economic impacts that was generated by US EPA for this analysis report. This spreadsheet can be found in the docket for this rulemaking.

become subject to different requirements. Additionally, new control technology may become available in the future at lower cost, and the EPA is unable to predict exactly how industry will comply with the rule in the future. The EPA is also unable to predict whether some firms will choose to exit the market due to the final requirements.

There may be an opportunity cost associated with the installation of environmental controls (for purposes of mitigating the emission of pollutants) that is not reflected in the compliance costs included in Section 4.1. If environmental investment displaces investment in productive capital, the difference between the rate of return on the marginal investment (which is discretionary in nature) displaced by the mandatory environmental investment is a measure of the opportunity cost of the environmental requirement to the regulated entity. To the extent that any opportunity costs are not included in the control costs, the compliance costs for this action may be underestimated.

The estimated changes in HAP emissions for affected facilities involve several uncertainties. These uncertainties, elaborated upon earlier in this section, pertain to the effectiveness of compliance methods in mitigating HAP emissions, as well as the projected production levels and operational dynamics of the impacted facilities. Additional uncertainties are from the availability and efficacy of control technologies and the potential introduction of supplementary regulations applicable to this source category. Furthermore, due to the absence of quantified health impacts associated with this final rule, we are unable to monetize the benefits, making the monetized net benefits associated with the regulated pollutants equal to the regulatory costs.