UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2024

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to
Commission File Number: 001-38221

Ecovyst Inc.

Delaware	**81-3406833**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
300 Lindenwood Drive	
Malvern, Pennsylvania	**19355**
(Address of principal executive offices)	(Zip Code)

(484) 617-1200
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading symbol	Name of each exchange on which registered
Common stock, par value $0.01 per share	ECVT	New York Stock Exchange

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. ☒ Yes ☐ No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. ☐ Yes ☒ No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. ☒ Yes ☐ No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). ☒ Yes ☐ No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). ☐ Yes ☒ No

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

The aggregate market value of Ecovyst Inc. voting and non-voting common equity held by non-affiliates as of June 30, 2024 (the last business day of the registrant's most recently completed second fiscal quarter) based on the closing sale price of $8.97 per share as reported on the New York Stock Exchange was $1,036,993,857.

The number of shares of common stock outstanding as of February 21, 2025 was 117,367,433.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Ecovyst Inc. Proxy Statement for the 2025 Annual Meeting of Stockholders are incorporated by reference into Part III of this report.

Ecovyst Inc.

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December 31, 2024

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PART I

Forward-looking Statements and Risk Factor Summary

This Annual Report on Form 10-K ("Form 10-K") includes "forward-looking statements" that express our opinions, expectations, beliefs, plans, objectives, assumptions or projections regarding future events or future results. The words "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "expect," "should" and similar expressions are intended to identify these forward-looking statements. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy, short- and long-term business operations and objectives, and financial needs. Examples of forward-looking statements include, but are not limited to, statements we make regarding demand trends, economic effects on our operations and financial results and our liquidity, potential strategic acquisitions or divestitures, the strategic review of our Advanced Materials & Catalysts segment, potential increased borrowing under our credit facilities, and our belief that our current level of operations, cash and cash equivalents, cash flow from operations and borrowings under our credit facilities and other lines of credit will provide us adequate cash to fund working capital requirements, capital expenditure projects, debt service requirements and other requirements for our business for at least the next twelve months.

These forward-looking statements are subject to a number of risks, uncertainties and assumptions. Moreover, we operate in a very competitive and rapidly changing environment and new risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed herein may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

Some of the key factors that could cause actual results to differ from our expectations include the following risks related to our business:

- as a global business, we are exposed to local business risks in different countries;
- we are affected by general economic conditions and economic downturns;
- exchange rate fluctuations could adversely affect our financial condition, results of operations and cash flows;
- our international operations require us to comply with anti-corruption laws, trade and export controls and regulations of the U.S. government and various international jurisdictions in which we do business;
- alternative technology or other changes in our customers' products may reduce or eliminate the need for certain of our products;
- our new product development and research and development efforts may not succeed and our competitors may develop more effective or successful products;
- our substantial level of indebtedness could adversely affect our financial condition;
- if we are unable to manage the current and future inflationary environment and to pass on increases in raw material prices, including natural gas, or labor costs to our customers or to retain or replace our key suppliers, our results of operations and cash flows may be negatively affected;
- we face substantial competition in the industries in which we operate;
- we are subject to the risk of loss resulting from non-payment or non-performance by our customers;
- we rely on a limited number of customers for a meaningful portion of our business;
- multi-year customer contracts in our Ecoservices segment are subject to potential early termination and such contracts may not be renewed at the end of their respective terms;
- our quarterly results of operations are subject to fluctuations because demand for some of our products is seasonal;
- our growth projects may result in significant expenditures before generating revenues, if any, which may materially and adversely affect our ability to implement our business strategy;

- we may be liable to damages based on product liability claims brought against us or our customers for costs associated with recalls of our or our customers' products;
- we are subject to extensive environmental, health and safety regulations and face various risks associated with potential non-compliance or releases of hazardous materials;
- existing and proposed regulations to address climate change by limiting greenhouse gas emissions may cause us to incur significant additional operating and capital expenses and may impact our business and results of operations;
- production and distribution of our products could be disrupted for a variety of reasons, including as a result of supply chain constraints, and such disruptions could expose us to significant losses or liabilities;
- the insurance that we maintain may not fully cover all potential exposures;
- we could be subject to damages based on claims brought against us by our customers or lose customers as a result of the failure of our products to meet certain quality specifications;
- our failure to protect our intellectual property and infringement on the intellectual property rights of third parties;
- disruption, failure or cyber security breaches affecting or targeting computers and infrastructure used by us or our business partners may adversely impact our business and operations;
- significant trade developments, including tariffs, could have an adverse effect on us;
- that we have a material weakness in our internal control over financial reporting and that we may identify additional material weaknesses in the future; and
- the other risks and uncertainties discussed in "Item 1A—Risk Factors."

The forward-looking statements included herein are made only as of the date hereof. You should not rely upon forward-looking statements as predictions of future events. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances reflected in the forward-looking statements will be achieved or occur. Moreover, neither we nor any other person assumes responsibility for the accuracy and completeness of the forward-looking statements. We undertake no obligation to update publicly any forward-looking statements for any reason after the date of this Form 10-K to conform these statements to actual results or to changes in our expectations.

ITEM 1. BUSINESS.

Ecovyst Inc. ("Ecovyst" or the "Company"), formerly PQ Group Holdings Inc. ("PQ Group Holdings") was incorporated in Delaware on August 7, 2015. We trace our roots to the late 1800's with our first sulfuric acid plant and the beginning of our oldest customer relationship. Our business has a history of innovation, enabling environmental improvements in areas such as fuel efficiency, sustainable fuels and the abatement of emissions from heavy-duty diesel engines, while improving the sustainability of our planet.

Our common stock is listed on the New York Stock Exchange under the stock ticker "ECVT". On August 1, 2021, we changed our name from "PQ Group Holdings Inc." to "Ecovyst Inc.," and changed the ticker symbol of our common stock listed on the New York Stock Exchange from "PQG" to "ECVT". On November 28, 2023, the Company renamed the "Catalyst Technologies" segment to "Advanced Materials & Catalysts". Unless the context otherwise indicates, the terms "Ecovyst Inc.," "we," "us," "our," or the "Company" mean Ecovyst Inc. and our subsidiaries.

Effective on August 1, 2021, we completed the sale of our Performance Chemicals business to Sparta Aggregator L.P., a partnership with Koch Minerals & Trading, LLC and Cerberus Capital Management, L.P. The results of operations, financial condition and cash flows for the Performance Chemicals business are presented herein as discontinued operations for the 2022 periods presented. Refer to Note 4 to our consolidated financial statements for additional information.

Our Company

We are a leading integrated and innovative global provider of advanced materials, specialty catalysts and services. We believe that our products and services contribute to improving the sustainability of the environment. Our value-added products seek to address global demand trends that are often either the subject of significant environmental and safety regulations or are driven by consumer preferences for more sustainable products, which provides us with high-margin growth opportunities. We believe that our products contribute to lower emissions and cleaner air, higher fuel efficiency and cleaner fuels, and are key enablers to advance the global transition to clean energy. Specifically, our products and solutions help companies in the production of sustainable fuels and help to produce vehicles with improved fuel efficiency and cleaner emissions.

We believe we are a leader in each of our business segments, holding what we estimate to be a number one or number two supply share position for products that generated more than 90% of our 2024 sales. We believe that our global footprint and efficient network of strategically located manufacturing facilities provide us with a strong competitive advantage in serving our customers both regionally as well as globally.

Our products typically constitute a small portion of our customers' overall end-product costs, yet are critical to product performance. We believe, with our long history of customer partnerships and our reputation for providing reliable, quality products and solutions, our products deliver significant value to our customers, as demonstrated by our profit margins.

We have a long track record of innovation that is reflected in our technical and production expertise in silica, zeolites and catalyst technologies.

We are highly diversified by business, geography and end use. In 2024, the majority of our sales were for applications that have historically had relatively predictable, consistent demand patterns driven by consumption or frequent replacement cycles.

As a result of our competitive strengths, we have generally maintained stable margins through changing macro economic cycles.

In 2024, we served global customers across many end uses and as of December 31, 2024, operated out of ten strategically located owned manufacturing facilities.

Our Strategy

We intend to capitalize on our strong business fundamentals, sustainability driven innovation and customer partnerships to grow sales, maintain high margins, deploy capital efficiently and generate consistent free cash flow in order to create shareholder value. We believe that our long history of operational excellence and proven reliability, technology leadership, strong customer relationships, innovation track record and consistent business execution developed from our industry experience positions us well to execute our business strategy.

Our Industry

Our industry is characterized by a strong commitment to innovate and to develop enhanced performance and solutions that improve the environment, health and sustainability. In turn, this drives Ecovyst to constantly develop new products and the need to support our customers with new product innovation and technical services. Our innovation is strongly focused on customer partnerships. We believe a key capability is our ability to go from laboratory to pilot to full scale production with both the speed and consistency required for our customers' demand for our products.

The products and services that we sell to our customers are often high value-add, even when they represent a small portion of the overall end product costs, and we believe success can be achieved by helping customers improve their product performance, value and quality. We believe many of the end uses that we serve are generally more resilient to economic cycles, minimizing extreme fluctuations in demand. In addition, many products have relatively high switching costs, including the risk of quality failures, thus making it more beneficial for customers to work with incumbent producers. In addition, the capital cost to expand existing capacity is typically significantly less than the capital cost necessary to build a new plant. We believe the combination of attractive operating margins, growing end uses and generally predictable maintenance capital expenditure requirements improves our ability to generate attractive cash flows.

Our Product End Uses

The table below summarizes our key end use applications and products, as well as the significant growth drivers in those applications.

Key End Uses	Significant Growth Drivers	Key Products
Clean Fuels, Emission Control & Other	• Global regulatory requirements to:	• Refining hydrocracking catalysts
	• Reduce sulfur from diesel and gasoline	• Emission control catalysts
	• Remove nitrogen oxides from tailpipe emissions	• Catalyst supports used in the production of sustainable fuels such as renewable diesel
	• Growing demand for sustainable fuels	• Catalysts used in production of sustainable aviation fuels
	• Growing demand for ex-situ catalyst activation to support traditional and sustainable fuels production	• Catalyst activation
	• Improve lubricant characteristics to improve fuel efficiencies	• Aluminum sulfate solution
	• Municipal and industrial water treatment	• Ammonium bisulfite solution
Polyethylene, Polymers & Engineered Plastics	• Demand for high-density polyethylene used for strengthening and light weighting components	• Catalysts and catalyst supports for high-density polyethylene and chemicals syntheses
	• Demand for durable packaging	• Antiblock for film packaging
	• Growing demand for recycling of materials	• Catalyst for advanced recycling
Regeneration and Treatment Services	• Increase gasoline octane in order to improve fuel efficiency while lowering vapor pressure and sulfur to regulated levels	• Sulfuric acid regeneration services
	• High industry utilization	• Hazardous waste treatment services
	• Growing demand for applications in hazardous and non-hazardous waste	
Industrial, Mining & Automotive	• Demand for metals and minerals for low carbon technologies and infrastructure	• Virgin sulfuric acid for mining
	• Demand for a wide range of products including construction materials, auto, consumer goods, petrochemicals and chemicals	• Virgin sulfuric derivatives for industrial production
	• Recovery in global oil drilling/U.S. copper production	• Virgin sulfuric derivatives for nylon production

The table below summarizes sales for the years ended December 31, 2024, 2023 and 2022, respectively:

Key End Uses	December 31, 2024				December 31, 2023				December 31, 2022			
	Sales	% of Sales	Zeolyst JV Sales[1]	% of Zeolyst JV sales[2]	Sales	% of Sales	Zeolyst JV Sales[1]	% of Zeolyst JV sales[2]	Sales	% of Sales	Zeolyst JV Sales[1]	% of Zeolyst JV sales[2]
	(in millions, except percentages)											
Clean Fuels, Emission Control & Other												
Ecovyst	$ 34.0	5.0 %	$ —	—%	$ 29.9	4.0 %	$ —	—%	$ 29.0	4.0 %	$ —	—%
Zeolyst Catalyst	—	—%	90.2	77.0 %	—	—%	127.0	81.0 %	—	—%	103.4	78.0 %
Polyethylene, Polymers & Engineered Plastics												
Ecovyst	$ 106.2	15.0 %	$ —	—%	$ 106.2	15.0 %	$ —	—%	$ 117.7	14.0 %	$ —	—%
Zeolyst Catalyst	—	—%	26.3	23.0 %	—	—%	29.5	19.0 %	—	—%	29.2	22.0 %
Regeneration and Treatment Services												
Ecovyst	$ 357.4	51.0 %	$ —	—%	$ 354.6	52.0 %	$ —	—%	$ 342.6	42.0 %	$ —	—%
Zeolyst Catalyst	—	—%	—	—%	—	—%	—	—%	—	—%	—	—%
Industrial, Mining & Automotive												
Ecovyst	$ 206.9	29.0 %	$ —	—%	$ 200.4	29.0 %	$ —	—%	$ 330.9	40.0 %	$ —	—%
Zeolyst Catalyst	—	—%	—	—%	—	—%	—	—%	—	—%	—	—%
Total	$ 704.5		$ 116.5		$ 691.1		$ 156.5		$ 820.2		$ 132.6	

(1) Represents 50% of the Zeolyst Joint Venture (the "Zeolyst Joint Venture" or "Zeolyst JV") sales for each of the years ended December 31, 2024, 2023 and 2022, respectively. Refer to "Management's Discussion and Analysis of Financial Condition and Results of Operations — Basis of Presentation" for a description of the treatment of the Zeolyst JV in our consolidated financial information.

(2) Percentage calculations are based on $116.5 million, $156.5 million and $132.6 million of sales attributable to the Zeolyst Joint Venture, which represents 50% of its total sales for each of the years ended December 31, 2024, 2023 and 2022, respectively.

Competitive Business Strengths

Favorable Secular Growth Trends Across the Portfolio

We focus on serving end use applications where we believe our competencies can create value adding solutions and where significant growth potential exists. Our products and services address our customers' needs, which are typically driven globally by regulatory requirements, consumer preferences or sustainability trends. We believe that our products and services incorporate innovative environmental, sustainability and safety solutions to address evolving customer demands, examples of which include the following:

- Increased use of polyethylene-based plastics as a substitute for heavier and less versatile materials and increasing consumption of plastics is driving increased global demand for polyethylene production and also capacity expansions. Further, we are seeing a shift towards silica-based technology, which we believe will drive growth for our Advanced Silicas product group within our Advanced Materials & Catalysts segment.
- Acceleration of global commitments to increase the recycling of plastics. Within our Zeolyst Joint Venture, our zeolite-based catalysts help improve the efficiency of thermal pyrolysis. We are partnering with technology licensors to help enable the advanced recycling of plastics.
- The decarbonization of heavy-duty trucking and aviation industries by using sustainable fuels. Our Zeolyst Joint Venture leverages our knowledge of lubricant dewaxing to develop products that efficiently dewax renewable diesel. Dewaxing is a process where longer chain hydrocarbons are broken down into chain lengths that remain liquid at colder temperatures, allowing fuel flow in trucks during colder temperatures. Legislative drivers and financial incentives are leading to capacity builds at our customers, driving demand for our products. For the production of sustainable aviation fuel, our specialty zeolites are used in the hydrocracking and dewaxing steps, enabling the fuel quality required for sustainable aviation fuel to be produced. In addition, some manufacturing processes involve converting alcohol into jet fuel where our zeolites catalyze the building or oligomerization of molecules into longer chains that more efficiently combust to generate power.
- Light- and heavy-duty diesel engines are subject to a broad set of regulatory requirements and emission standards. We believe these trends present global opportunities for the Zeolyst Joint Venture to support our customers in meeting these standards through our sales of emission control catalysts. Legislative efforts continue to reduce acceptable emission profiles, including a focus on cold start conditions, which we believe create positive opportunities for zeolite-based technologies along with other solutions that customers benchmark to develop their preferred solution.

We believe that stringent fuel efficiency standards that spur the use of high compression engines requiring higher-octane gasoline and continued stringent regulatory requirements for gasoline will continue to encourage strong alkylate production at our refining customers. We believe that our Ecoservices segment is well positioned to benefit from any related growth in demand for alkylate.

We also believe we have opportunities to displace other less environmentally friendly materials for industrial and consumer good applications through our business segments. Our Ecoservices segment is the largest North American recycler of sulfuric acid and one of the largest consumers of refinery by-products of sulfur, enabling them to be converted to other applications.

Leading Supply Positions

We believe that we maintain a leading supply position for certain products sold within each of our segments, holding what we estimate to be the number one or two supply share position in 2024 for products that generated more than 90% of our sales. We believe that our global footprint and efficient network of strategically located owned manufacturing facilities provides us with a strong competitive advantage in serving our customers both globally and regionally, and that it would be costly for our competitors to replicate our network.

In our Advanced Materials & Catalysts segment, we primarily compete on a global basis. We are a leading supplier of zeolites used for catalysts that support the production of sustainable fuels, zeolite-based catalyst used to remove sulfur in the refinery hydrocracking process and emission control catalysts used in the heavy- and light-duty diesel industries to reduce nitrogen oxides emissions. We are a global supplier of silica-based advanced materials and supports for polyethylene manufacturers and custom catalyst applications, including catalyst used to produce methyl methacrylate ("MMA"), bio-butadiene and bio-catalysis used to immobilize enzymes onto silica supports.

Innovation Track Record

We believe a key competitive advantage is derived from our depth of expertise in creating and modifying advanced materials based on silica and zeolite technologies. We believe we capture value through customer collaboration. We have the ability to tailor and scale custom advanced materials to meet changing demands and to provide technical support for large scale commercialization. Many of our products require close customer collaboration to address constantly evolving customer application challenges. Given the long lead-time required for product development and commercialization, we work closely and build long-term relationships with our customers. In many cases, our relationships have spanned decades given our ability to meet customized specifications and performance characteristics while also maintaining strict quality standards.

These long-term relationships have allowed us to innovate together with our customers to meet evolving demands. For example, we have developed zeolite-based catalysts that are effective and efficient at reducing pollutants from heavy- and light-duty diesel engines, enabling our customers to meet increasingly stringent vehicle emission standards worldwide. We manufacture zeolite-based advanced materials used in the production of sustainable fuels to help advance the global transition to clean energy and to enable advanced recycling of plastics through the catalyzed thermal pyrolysis of plastic wastes. Our proprietary silica-based advanced materials have enabled development of a high strength high-density polyethylene ("HDPE") resin that is used for making lightweight plastic gasoline tanks for automobiles and enables everyday items such as plastic containers and piping used to construct new buildings. In addition, we participate in bio-catalysis where our advanced silica-based materials are used to immobilize enzymes and to enable CO_2 capture and storage.

Long-Term, High Quality Customer Relationships

We collaborate with leading multinational companies that often seek global solutions. Our customers include large industrial companies such as ExxonMobil, and global catalyst producers such as UOP and Grace. We also supply catalysts to leading chemical and petrochemical producers such as Dow Chemical, Mitsubishi Chemical, LyondellBasell, CP Chemicals, Valero, Saudi Aramco and Shell. We have long-term relationships with our top ten customers, based on 2024 sales, that average more than 50 years. In addition, our customer base is diversified, with our top ten customers in 2024 representing approximately 60% of our sales for the year ended December 31, 2024, of which two customers had more than 10% of our total sales. Customer A was 14% or $96 million and Customer B was 11% or $78 million of our sales, in both our Ecoservices and Advanced Materials & Catalysts businesses during this period.

Secured Contractual Pass-through of Raw Material Costs Support Stable Margins

We have been able to mitigate the impact of raw material or energy price volatility using a variety of mechanisms, including raw material cost pass-through mechanisms in our sales contracts and other adjustment provisions. Most of our Ecoservices contracts feature minimum volume protection and/or quarterly price adjustments for items such as commodity inputs, labor, the Chemical Engineering Plant Cost Index and natural gas. In 2024, approximately 90% of our Ecoservices segment sales occurred under contracts that included some form of raw material pass-through clause. These price adjustments generally reflect our Ecoservices segment's actual cost structure in producing sulfuric acid, and tend to provide us with some protection against volatility in labor, fixed costs and raw material pricing. Freight expenses are generally passed through directly to customers.

Our products are produced from readily available raw materials. We also use natural gas in our manufacturing process where our North American facilities have benefited from the plentiful supplies of shale gas. In addition, we have long-term contracts and relationships with many of our key raw material suppliers across all of our business segments.

Long-Term Customer Contracts Enhance Sales Predictability and Stability

We partner with many of our customers under long-term contract agreements, 100% requirement arrangements and/or specified products for certain licensed production processes. In our Ecoservices segment, approximately 50% of our production capacity serves customers with staggered multi-year commitment contracts with potential for value pricing resets and cost pass-through for our regeneration services product line that enhance sales and margin predictability and stability. Excluding contracts with automatic evergreen provisions, approximately 40% of our sulfuric acid volume for the year ended December 31, 2024 was under contracts expiring at the end of 2025 or beyond.

In our Advanced Materials & Catalysts segment, we are either the sole or dual supplier to key global customers under various term agreements up to 10 years for polyethylene catalysts and advanced silicas supports. Further, we have a multi-year supply agreement for MMA catalyst with a leading global producer. In our Zeolyst Joint Venture, where we supply catalysts and zeolite powders for refining, sustainable fuels, and emission controls applications, we operate with a mix of evergreen and various term contracts depending on the product customization. These terms, in line with industry standards, provide us with flexibility in satisfying customers.

Strategic and Differentiated Manufacturing Know-how and Supply Chain Global Network

Ecoservices' predecessor company, Stauffer Chemical, was a leader in pioneering the current sulfuric acid regeneration technology in the 1940s. Since then, we have leveraged our process technology expertise and ability to deliver our products by barge, rail, truck and pipeline to become the largest sulfuric acid regenerator in North America and a leading North American producer of high quality virgin sulfuric acid. Ecoservices has also applied its expert knowledge in thermal decomposition to provide treatment services for hazardous/non-hazardous wastes, and most recently to activate to catalysts with our patented Chem 32, LLC ("Chem32") technology acquired in March 2021.

Our Advanced Materials & Catalysts product development and manufacturing technology is customized based on deep silica and zeolite-based advanced material science know-how. Our R&D centers seek to develop fit for purpose catalysts with customers. We believe we have a differentiated capability to develop such products and manufacture them consistently.

Stable Margins and Cash Flow Generation Across Changing Macroeconomic Cycles

The secular trends supporting many of our business segments has allowed us to maintain stable margins while continuing to grow in different macroeconomic environments. We believe that the stability of our margins and cash flows is also aided by long-term sales contracts and material cost pass-through provisions. Our ability to enter into favorable contracts and terms with customers is driven by our long history of collaborative relationships and track record of providing value-added products and services. We believe that our value-added products and services have proven to be critical to the performance of our customers' products and typically represent only a small portion of our customers' overall end-product costs.

We believe our strong commercial contact structure enables our businesses to generate strong operating cash flow. In addition, our cash flow generation has been driven, in part, by lower debt levels, our disciplined capital investment, as well as tax attributes that provide us with cash flow benefits. As of December 31, 2024, we had $174.8 million of tax deductible intangibles and goodwill with respect to Eco Services Operations Corp, which provides us with cash tax savings as we generate taxable income.

Our Business Segments

We are a leading integrated and innovative global provider of advanced materials, specialty catalysts and services. We believe that our products and services contribute to improving the sustainability of the environment. We conduct operations through two reporting segments: (1) Ecoservices and (2) Advanced Materials & Catalysts (including our 50% interest in the Zeolyst Joint Venture).

The table below summarizes certain information regarding our two reporting segments for the year ended December 31, 2024.

Segments and Product Groups	Year ended December 31, 2024				
	Sales	Zeolyst Joint Venture Sales[1]	Net Loss	Adjusted EBITDA[1]	% of Total Adjusted EBITDA[1][2]
	(in millions, except percentages)				
Ecoservices	$ 598.3	$ —		$ 200.3	75.6 %
Advanced Materials & Catalysts	106.2	—		64.7	24.4 %
Zeolite Catalyst	—	116.5			
Subtotal	$ 704.5	$ 116.5			
Corporate				(26.8)	
Total	$ 704.5	$ 116.5	$ (6.7)	$ 238.2	100.0 %

(1) Represents 50% of the Zeolyst Joint Venture (the "Zeolyst Joint Venture" or "Zeolyst JV") sales for the year ended December 31, 2024. The Adjusted EBITDA of our Advanced Materials & Catalysts segment includes our 50% portion of the earnings from the Zeolyst JV. Refer to "Management's Discussion and Analysis of Financial Condition and Results of Operations—Basis of Presentation" for a description of the treatment of the Zeolyst Joint Venture in our consolidated financial information. Refer to "Management's Discussion and Analysis of Financial Condition and Results of Operations—Key Performance Indicators" for discussion of our use of non-GAAP financial measures and reconciliations.

(2) Percentage calculations exclude $26.8 million in corporate expenses.

Ecoservices

Our Ecoservices segment is a leading provider of sulfuric acid recycling ("regeneration services") and end-to-end logistics to North American refineries to support the production of alkylate, a high value gasoline blending component required for meeting gasoline specifications and producing premium grade fuel. We are also a leading North American producer of on-purpose virgin sulfuric acid for water treatment, mining, and industrial applications ("virgin sulfuric acid"). We provide treatment services for hazardous/non-hazardous industrial wastes ("treatment services") and with the acquisition of Chem32 in March 2021, we are also a leader in ex-situ sulfiding and pre-activation for hydro-processing catalysts, which are used in the production of traditional and sustainable fuels. By providing regeneration services, as well as purchasing by-product sulfur from customers for use in manufacturing virgin sulfuric acid, we believe that we provide our refining customers with a complete solution for their sulfuric acid needs.

We believe recent trends for increased alkylate production are being driven by: rising demand for premium gasoline used in smaller, more efficient turbocharged engines, which requires an alkylate content of approximately 40%-45%, as compared to the approximately 12%-13% alkylate content in regular gasoline; the need for more alkylate to meet the minimum octane ratings in regular gasoline following the continued significant share growth of shale oil refining in the U.S.; the full implementation of Tier 3 gasoline sulfur standards in the United States enacted in 2020, which requires the blending of additional low sulfur, high octane gasoline components such as alkylate; and rising gasoline exports, which gasoline generally contains no ethanol and generally requires more alkylate to replace the missing ethanol in order to meet minimum octane requirements in the destination countries.

Our Ecoservices segment is mostly regional due to shipping costs and our customer integration requirements. Our network of facilities is concentrated in the Gulf Coast and the state of California, where approximately 63% of the United States refining capacity is located. We believe that the strategic locations of our plants in these key refining regions contribute to our efficient supply chain networks with our customers, including in some cases captive pipelines connecting us to our refinery customers. Additionally, product can be shipped to our customers by barge, rail and truck.

Primary Product Groups

Regeneration services serves a critical need for refining customers. Sulfuric acid serves as a catalyst in the alkylation production process. The resulting spent sulfuric acid needs to be regenerated or recycled, which is no longer a core competency of most refiners. Since storage space for fresh and spent sulfuric acid is typically limited, and the cost to refineries of interruption to their alkylation units would be significant, refineries seek to have a continuous and reliable source of supply for sulfuric acid regeneration services.

Our end-to-end regeneration services offering takes the spent acid from the refinery, through our network of plants and transportation systems, and recycles the sulfuric acid into high strength fresh sulfuric acid for reuse in the alkylation process. Because of the number and strategic locations of our plants, and the breadth of our transportation logistics, we believe we bring the highest reliability and flexibility to our refining customers, allowing them to focus on their core competency by optimizing their alkylation capacity.

Virgin sulfuric acid is created either through incinerating sulfur in furnaces, or as a by-product of other industrial processes, primarily the smelting of copper and other base metals. Our sulfur-derived, high quality virgin sulfuric acid products supply a diverse set of end uses. Sulfur derived acid is generally considered to be of higher purity and quality than smelter-produced acid and, as a result, smelter-produced acid is not suitable for some industrial users including several of our larger customers who require higher quality and differentiated sulfuric acid products, such as super-saturated sulfuric acid (oleum). Virgin sulfuric acid is produced at all of our facilities utilizing the same production equipment as our regeneration services.

Our treatment services business is a niche offering providing a thermal destruction solution for the management of bulk quantities of hazardous and non-hazardous by-products, co-products and waste materials. We specialize in handling sulfur-bearing materials, acidic materials, high-temperature molten materials and other hard to handle liquids. Our process provides a beneficial reuse alternative to traditional disposal by capturing the energy value and sulfur content of these materials, supplementing our processes, and offsetting the use of virgin raw materials.

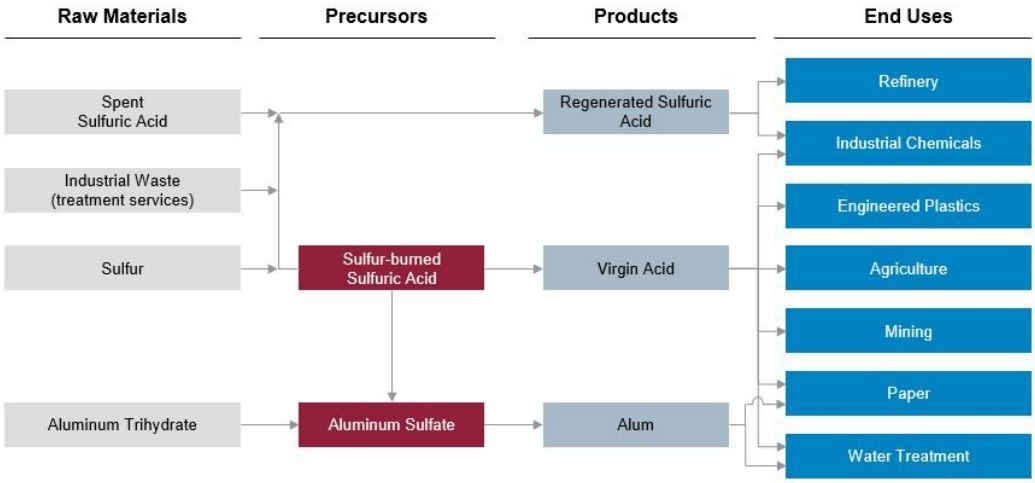
Competition

Given our strategic presence on the Gulf Coast and in California, and our relationships with leading refineries, we estimate that our regenerated sulfuric acid supply share is substantially larger than our closest competitor. We compete in the North American refining services industry with competitors such as Chemtrade and Nexpera, formerly the sulfuric acid business of Veolia. We compete on the basis of price, reliability, and responsiveness to changes in customer demand, which is a function of scale, proximity to customer locations and operational expertise. We believe that we benefit from industry economics that favor incumbent producers because the capital cost and regulatory challenges to expand existing capacity are typically significantly less than to build a new plant. In addition, existing robust supply chains, including captive pipeline connections and other transportation logistics, add to the competitive advantages available to incumbent producers. As a result, we believe that our integrated and strategically located network of facilities and end-to-end logistics assets in the United States provide us with a significant competitive advantage and would be costly for our competitors to replicate.

Manufacturing

We provide regeneration services and produce virgin sulfuric acid through our furnace operations. Regenerated sulfuric acid is produced by thermally decomposing the spent acid in our furnace into a clean gas stream, which is converted into sulfuric acid. Virgin sulfuric acid is produced by burning sulfur and certain sulfur-rich components at high temperatures within a furnace to create a gas stream. The chart below summarizes the manufacturing platform for our Ecoservices segment.

Ecoservices Manufacturing Platform



Advanced Materials & Catalysts

We are a leading global provider of advanced materials and specialty catalyst products and process solutions to leading producers and licensors of polyethylene. Our product groups include Advanced Silicas and Zeolite Catalysts. Zeolite Catalyst products are sold through the Zeolyst Joint Venture.

Advanced Silicas supplies finished catalyst and catalyst supports for the production of HDPE and linear low density polyethylene ("LLDPE"). HDPE is a high strength and high stiffness plastic used in bottles, containers, and molded applications, whereas LLDPE is used predominately for films. We also produce a catalyst that is used globally for the production of MMA, the monomer for acrylic engineering resins, a clear scratch-resistant plastic used in sheet or molded form to replace glass and as a durable surface coating. We also produce a catalyst used for the manufacture of bio-butadiene. Because these catalysts are highly technical and customized for our customers to manufacture products with specific properties, they are often covered under long-term supply agreements and, in some cases, we are a customer's sole source supplier. In addition, we supply silica anti-blocking products that are used to prevent opposite faces of polyethylene and polyester films from adhering to one another during manufacturing and in use. We also develop and supply functionalized silicas that are typically used in applications requiring high adsorption properties, including CO_2 capture and storage, water clean up and metals removal from waste.

The Zeolyst Joint Venture, (formed in 1988 specifically as Zeolyst International and Zeolyst C.V., our 50% owned joint venture with Shell Catalysts & Technologies, an affiliate of Royal Dutch Shell plc. or "Shell"), supplies high technology specialty zeolites and zeolite-based catalysts to customers for refining of oil primarily hydrocracking catalyst and dewaxing, sustainable fuels and emission control systems for both on-road and non-road diesel engines. We also supply custom zeolites to catalyst companies who compete in similar industries. The Zeolyst Joint Venture leverages each partner's technology and production expertise, including Shell's expertise in hydrocracking to maximize liquid product yields, especially distillate, while at the same time removing sulfur, and Ecovyst's expertise in zeolite research and development, production technology, and industry understanding for applications including sustainable fuels, emission control technology, advanced recycling and many customized zeolite catalyst solutions.

Hydrocracking catalyst is the most economic method to meet sulfur emission control standards for refiners while maintaining yields for diesel, which is considered one of the most profitable product streams. The Zeolyst Joint Venture is the sole supplier of hydrocracking catalyst to Shell for their own catalyst consumption, however, the majority of sales are to third-party refining customers. We also provide zeolite supports to many of the hydrocracking catalyst suppliers, positioning us as a leading supplier in the global hydrocracking catalyst value chain.

To meet nitrogen oxides emission control regulations that are expanding globally, many of our zeolite powders are used in an advanced emission control technology called selective catalytic reduction, largely focused on heavy-duty diesel transportation. This process uses ammonia to react with engine exhaust gases via our catalysts in order to convert nitrogen oxides, a pollutant, into harmless nitrogen and water. We believe that our zeolite catalysts can enable selective catalytic reduction technology to reduce the amount of nitrogen oxides in such exhaust gases by more than 90% and is one of the most cost-effective methods to reduce diesel engine emissions.

Competition

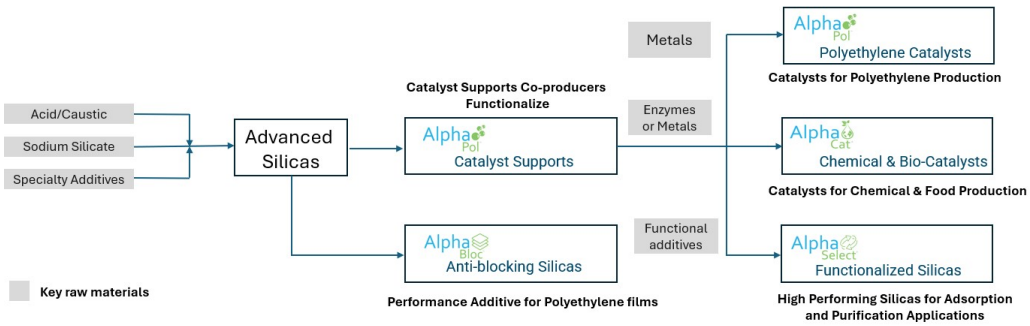
Our Advanced Silicas product group primarily competes with Grace with the catalyst components used for the production of polyethylene. The Zeolyst Joint Venture competes with global catalyst producers such as Grace, BASF, UOP, Axens, and Topsoe, while at the same time providing many of them customized zeolite solutions for their product offerings. Some direct competition with niche companies exists, including competitors such as Tosoh and Clariant. We typically compete on the basis of performance, product consistency, reliability and responsiveness to changes in customer demand.

Manufacturing

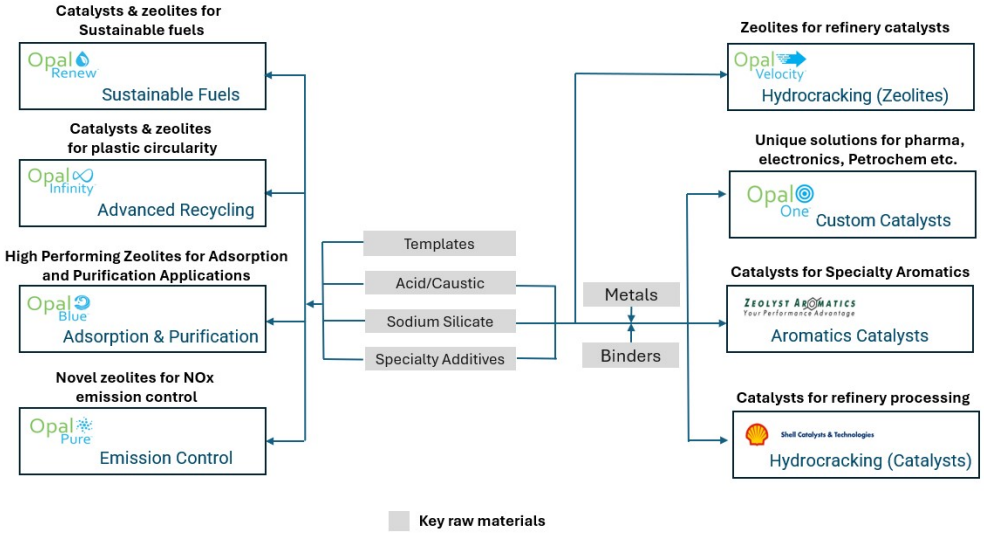
We manufacture our catalyst products using sodium silicate to make specialty zeolite and silica products. These zeolites and silicas are either used directly to produce catalysts or are sold as precursors to other catalyst manufacturers.

The chart below summarizes the manufacturing platform for our Advanced Materials & Catalysts segment.

Advanced Silicas Manufacturing Platform



Zeolyst Joint Venture Manufacturing Platform



Raw Materials

Our products are produced from readily available raw materials such as sodium silicate and sodium hydroxide ("caustic soda"). We also use natural gas and electricity in our manufacturing process, with our North American facilities benefiting from the plentiful supplies of shale gas. In addition, we have long-term supply relationships with many of our key raw materials suppliers. We aim to mitigate the impact of raw material or energy price volatility using a variety of mechanisms, including cost pass-through clauses in our sale contracts and other adjustment provisions.

We are able to negotiate our supply agreements for our key raw materials based on our leading industry position and global scale in an effort to achieve competitive pricing. We also maintain a raw material quality audit and qualification program designed to ensure that the material we purchase satisfies stringent quality requirements. Key raw materials for our segments include:

Key Raw Materials	Segments
Sodium hydroxide ("caustic soda")	Ecoservices
Sulfur	Ecoservices
Sodium silicate	Advanced Materials & Catalysts

While natural gas is not a direct feedstock for any individual product, we use natural gas powered furnaces to heat raw materials and create the chemical reactions necessary to manufacture our products. We maintain multiple suppliers wherever possible and we seek to forward purchase to stabilize our exposure to fluctuations in prices for natural gas. Where possible, we also utilize pass-through clauses for raw material and natural gas costs in our customer contracts. However, we may not be successful in passing through all increases in raw material costs or maintaining an uninterrupted supply of natural gas for all of our furnaces. See "Risk Factors—Risks Related to Our Business — If we are unable to pass on increases in raw material prices, including natural gas, to our customers or to retain or replace our key suppliers, our results of operations and cash flows may be negatively affected".

Zeolyst Joint Venture

The Zeolyst Joint Venture is a long-standing partnership with Shell, that dates back to 1988 and is focused on the development, manufacture and sale of zeolite-containing catalysts through manufacturing facilities located in Kansas, USA and the Netherlands. We combine our expertise in zeolite supply and technology with our partner's expertise in global refinery catalyst sales and technology. We have a 50% ownership stake in the Zeolyst Joint Venture. We produce zeolites that are precursors for the production of hydrocracking catalyst and sustainable fuels catalysts. Our extensive expertise in zeolite production enables us to manage the production of specialty zeolites which includes custom catalyst solutions, aromatic, mainly Xylene focused catalysts, dewaxing catalysts that improve lube oil performance, and paraffin isomerization catalysts that upgrade olefins to high octane gasoline blending components for refinery and petrochemical customers. In addition, our products include zeolite-based catalysts that enable catalytic based thermal pyrolysis of plastics wastes and adsorbents that enable the selective purification of waste streams.

Research and Development

We benefit from the highly-skilled technical capabilities of our employees who are dedicated to new product development. We operate two research and development facilities: one in the United States and one in the United Kingdom. Our research and development activities are directed toward the development of new and improved products, processes, systems and applications for customers. Our research and development team is organized to support each of our operating businesses and staffed with experienced scientists, technical service representatives and process engineers with direct knowledge of our products. This business group and customer-oriented team structure provides strong links between our product development and manufacturing functions and our customer collaboration and specifications. These connections enable us to focus our development on timely and relevant products for our customers while remaining attentive to manufacturing considerations that enable us to produce new products profitably and in a timely manner. Product development activities are organized into research and development projects that are subject to regular reviews by the business teams in order to understand and address our customers' evolving needs and invest in our growth by prioritizing innovation driven by these identified needs. In addition, we hold senior-level project reviews to ensure best practices are shared and consistent metrics are used to determine a project's merit and the size of the potential opportunity.

Intellectual Property

We evaluate how best to use patents, trademarks, copyrights, trade secrets and other available intellectual property protections on a case-by-case base. This is done to protect our products and our critical investments in research and development, manufacturing and marketing. We focus on securing and maintaining patents for certain inventions such as composition-of-matter, while maintaining other inventions such as process improvements as trade secrets to maximize the value of our product portfolio and reinforce our competitive advantage. Our policy is to seek appropriate intellectual property protection for significant product and process developments in the major areas where the relevant products are manufactured or sold. Patents may cover products, processes, intermediate products and product uses. Patents extend for varying periods in accordance with the date of patent application filing and the legal life of patents in the various countries in which the patents are registered. The protection afforded, which may also vary from country to country, depends upon the type of subject matter covered by the patent and the scope of the claims of the patent.

In most industrial countries, patent protection may be available for new substances and formulations, as well as for unique applications and production processes. However, given the geographical scope of our business and our continued growth strategy, there are regions of the world in which we do business or may do business in the future where intellectual property protection may be limited and difficult to enforce. Moreover, we monitor our competitors' products and, if circumstances were to dictate that we do so, we would vigorously challenge the actions of others that conflict with our patents, trademarks and other intellectual property rights. We maintain appropriate information security policies and procedures reasonably designed to ensure the safeguarding of confidential information including, where appropriate, data encryption, access controls and employee awareness training.

We own or have rights to a number of patents relating to our products and processes. As of December 31, 2024, we owned 22 patented inventions in the United States, with 169 patents issued in countries around the world and 63 patent applications pending worldwide. As of December 31, 2024, we also had 86 trademark registrations worldwide, including 5 U.S. trademark registrations. We also have 131 pending trademark applications, which include applications in the United States and worldwide. In addition to our registered and applied-for intellectual property portfolio, we also claim ownership of certain trade secrets and proprietary know-how developed by and used in our business. Including our Zeolyst Joint Venture, we are party to certain arrangements whereby we license in the right to use certain intellectual property rights in connection with our business.

Seasonality

Our regeneration services product group, which is a part of our Ecoservices segment, typically experiences seasonal fluctuations as a result of higher demand for gasoline products in the summer and lower demand in the winter months. These demand fluctuations result in higher sales and working capital requirements in the second and third quarters.

Sustainability Overview

Sustainability is intertwined with our daily business and is reinforced through our strategy and values. We strive to create sustainable products that are safe for the environment, and to reduce waste and increase efficiencies for our customers and stakeholders. We believe that our products contribute to lower emissions and cleaner air, advance the global transition to clean energy, support the circular plastics economy and ensure clean, purified drinking water. We are committed to creating environmentally responsible products that we believe make a difference in people's daily lives and for our planet.

While offering products and services that help our customers to advance their own sustainability goals, we also work to advance our commitment to maintain sound environmental, social and governance practices, policies and procedures. For example, we:

- Were awarded a 2024 Platinum Sustainability Rating from EcoVadis, a third-party sustainability evaluation company. The Platinum Medal rating from EcoVadis placed us among the top 1% (99th percentile) of all companies assessed by EcoVadis over the prior twelve-month period;
- Maintained an executive level position of Vice President – Environment and Sustainability that reports directly to our CEO;
- Under the leadership of our Global Director of Health, Safety and Process Safety Management, instituted additional health, safety and process safety programs, as well as continued our company-wide employee health and wellness program that covers both physical and mental health;
- Achieved zero OSHA recordable injuries among our employees and embedded contractors in 2024;
- Provided enhanced sustainability information on our website and published our 2023 Sustainability Report in June 2024, our third as Ecovyst;
- Continued work towards our 2025 and 2030 sustainability goals regarding fuel usage, power usage, health, safety and environment performance, and community engagement;
- Introduced our employees to our core values - Stewardship, High Standards, Integrity and Engagement ("SHINE") and provided training on these values and provisions of our Code of Conduct, completing training for approximately 99.8% of active employees in 2024;
- Continued steps to implement additional improvements in a number of areas, including health, safety and environmental ("HSE") performance; commitment to diversity, inclusion and human rights both within our company and in our supply chain; and ethical and lawful business practices;
- Further integrated a corporate-wide sustainability software platform, which we are utilizing as an internal, real-time sustainability performance dashboard to enable improved analytics and greater visibility into our sustainability impacts; and
- Achieved a greater than 93% performance in our flagship HSE Perfect Days program in 2024, which targets at-risk behaviors and celebrates positive HSE performance across the organization on a daily basis.

The sections that follow provide some highlights of our environmental, social and governance programs and procedures.

Environmental Stewardship

Our products and technologies continue to address our customers' sustainability challenges, tightening global regulatory standards and changing consumer preferences. In our Ecoservices segment, we provide regeneration services that avoid significant landfill or deep well disposal of spent, or used, sulfuric acid. In our Advanced Materials & Catalysts segment, our zeolite catalysts are used for cleaner air applications and our advanced silicas are key for light weighting and plastics recycling.

As part of our sustainability commitment regarding our own operations, we apply the principles of the Environmental Management standard of the International Organization for Standardization (ISO 14001) at our facilities throughout the world. For all of our facilities in the United States, we also adhere to the Responsible Care® RC14001 Technical Specifications of the American Chemistry Council ("ACC").

We maintain policies and procedures to monitor and control HSE risks, and to enable compliance with applicable state, national, and international HSE requirements. We have comprehensive HSE compliance, auditing and management programs in place to assist in our compliance with applicable regulatory requirements and with internal policies and procedures, as appropriate. Each Ecovyst facility has developed and implemented specific critical occupational health, safety, environmental, security and loss control programs.

We also have strong Health and Safety ("H&S") and Environmental and Sustainability ("E&S") organizations staffed by professionals who are responsible for health, safety, process safety, sustainability, product stewardship and product safety regulatory compliance. Our H&S and E&S organizational structures feature executive management-level leadership, active oversight by our Board and dedicated H&S and E&S experts on staff. We have a Global Director of Health, Safety and Process Safety Management and also have Regional H&S Specialists and Managers who are embedded in the field and provide H&S expertise and support to operating sites. In addition, our Vice President Environmental and Sustainability oversees a team of environmental personnel that serve our operating sites.

As an ACC Responsible Care® member company, we continue to monitor and report our HSE metrics annually. Most recently, our 2023 sustainability data for Scope 1 and 2 greenhouse gas ("GHG") emissions, water withdrawal and the mass of hazardous and nonhazardous waste generated was verified to the requirements of the WRI/WBSCD GHG Protocol Corporate Accounting and Reporting Standard, revised edition (2004, as amended in 2013), the GHG Protocol Scope 2 Guidance (2015) and the Company's metrics for water withdrawal and waste generated by an independent third party to a reasonable level of assurance. We included the assured data on our website and in our 2023 Sustainability Report, which we published in June 2024.

We also maintain a Product Safety and Product Stewardship management system that is compliant with the RC14001 technical specification and is supported by a highly skilled Director of Product Stewardship. We conduct Product Stewardship reviews as part of new product development and routinely evaluate product safety risk for raw materials, intermediates, and finished products.

Social Responsibility, including human capital discussions

We seek to act in a socially responsible manner through our various HSE programs as described above, our commitment to building a diverse and inclusive workforce, engagement with and support for the communities where we live and work, and advancement of socially responsible business practices through partnerships and other industry frameworks.

We are committed to providing equal employment opportunities for all employees and applicants for employment, and do not discriminate on the basis of race, color, religion, sex, sexual orientation, pregnancy, gender identity and expression, national origin, disability, age (40 or above), ancestry, genetic information, marital status, veteran status or any other classification protected by law. This commitment applies to all terms and conditions of employment, including recruiting, hiring, placement, advancement, training, transfer, demotion, lay off and recall, termination, compensation and benefits.

It is our policy to comply with all applicable laws and regulations in each jurisdiction in which we operate in order to provide appropriate working conditions for our colleagues. This means that we comply with applicable laws regarding the employment relationship including those that (1) prohibit child labor, (2) set acceptable working conditions and working hours, (3) provide for fair wages, including minimum wages and overtime, (4) prohibit forced or bonded labor, (5) permit freedom of association and collective bargaining, and (6) prohibit discrimination, harassment and other forms of degrading or inhumane treatment. Using tools such as our Supplier Code of Conduct and contractual provisions, we also hold our business partners to these same standards.

We further our people by acknowledging our workforce is key to our success. We offer highly competitive salaries, benefits, developmental opportunities and work/life balance. We proactively seek to attract, incentivize and retain a talented and motivated workforce. Our global performance management and succession planning processes are designed to provide sufficient talented personnel to fill key leadership, innovation and manufacturing roles well into the future and to better prepare employees for their future at the Company.

We review our compensation and benefits programs periodically to ensure continued competitiveness. In the United States, our benefit programs are designed to help protect the health and financial well-being of our full-time employees and their family members, offering a choice of several medical & dental plans, as well as vision, flexible spending accounts, short-term and long-term disability insurance and an employee assistance program. To help them prepare for their future, we offer a defined contribution savings plan, which includes company contributions. Benefits outside the United States are designed to supplement government-provided programs in each country.

We benefit from our talented, dedicated and diverse employee population and we actively promote diversity in an effort to maintain a workforce that reflects the diversity of the societies in which we operate. As of December 31, 2024, we had 920 employees worldwide, of which 798 were employed in the United States. Further, as of December 31, 2024, approximately 25% of our U.S.-based executives, managers and professionals were females and 21% were non-white males. As of December 31, 2024, approximately 45% of our employees were represented by a union, works council or other employee representative body. We believe we have good relationships with our employees and their respective works councils, unions and other bargaining representatives.

This international strength, supported by our core values of SHINE, fosters a rich culture founded on diversity of thought. We firmly believe that success is achieved through the intellect and commitment of our people, so we employ a long-term human capital program to attract, retain and develop talent for the future. We are proud of our highly collaborative teams that enable an inclusive workplace where employees are encouraged to bring their own experiences to promote innovation from all levels of the organization. This constructive work environment is supplemented with a fully integrated on-line performance management process that improves the communication of aligned goals, encourages consistent feedback and furthers employee engagement. Today, there are women on the leadership teams of each of our businesses as well as in our R&D, Finance, E&S and Human Resources functions.

In 2024, our sites continued to have a positive impact in the communities in which we operate. The following table outlines some of those impacts.

Location	Community Impact
The Woodlands, Texas	• Participated in flood relief efforts by handing out cleaning supplies and food • Participated in a food drive sponsored by a non-profit organization to provide Thanksgiving meals • Donated gift cards to a non-profit organization that offers emergency shelter
Houston, Texas	• Provided school supplies to a local elementary school • Bagged and distributed food at a local food bank • Worked with a local organization to provide items for first-time mothers
Hammond, Indiana	• Provided school supplies to a local elementary school • Volunteered at a local soup kitchen • Donated funds to a local youth football team to help replace equipment lost in a fire
Baytown, Texas	• Donated supplies, sports apparel and equipment to a local elementary school • Volunteered at a United Way sponsored breakfast
Baton Rouge, Louisiana	• Collaborated with a non-profit organization to renovate the residence of an elderly homeowner
Martinez, California	• Hosted students from a local university
Dominguez, California	• Packed 600 boxes of food for distribution to local families • Donated funds to a local school • Donated funds to a local youth baseball team • Participated in a blood drive
West Orange, Texas	• Provided school supplies to a local elementary school • Purchased supplies from teachers' wish lists
Kansas City, Kansas	• Donated clothing to the Big Brothers Big Sisters organization • Participated in the Adopt-an-Angel program to provide holiday gifts to children
Warrington, United Kingdom	• Sponsored uniforms for a local youth soccer team
Delfzijl, The Netherlands	• Donated funds to a local food pantry
Conshohocken, Pennsylvania	• Cleaned the surrounding neighborhood for Earth Day and Adopt-A-Highway Clean up Day
Malvern, Pennsylvania	• Provided non-perishable foods and turkeys to a local food pantry to provide Thanksgiving meals to families • Participated in the Adopt-a-Child program to provide holiday gifts to children

We have implemented a paid volunteer leave policy in 2025 that allow employees to take up to eight hours of pay each calendar year to participate in volunteer activities with approved organizations.

Governance

We maintain and consistently reinforce within our organization a series of policies and practices designed to ensure that decisions made on behalf of our company are properly made and executed. Our governance programs and policies start with a strong tone at the top and are summarized in our Executive Statement on Ethics and Compliance, which has been issued by our CEO and our Chief Compliance Officer and distributed throughout the organization.

The principles set forth in the Executive Statement are codified in our Code of Conduct, which sets forth the legal and ethical standards to which our employees must adhere, including (a) acting with integrity, (b) avoiding actual or apparent conflicts of interest, (c) complying with the laws and regulations of federal, state, provincial, local governments, and other appropriate regulatory agencies, (d) complying with all laws and regulations prohibiting fraud, bribery, corrupt practices, anti-competitive activities and trading with embargoed persons and countries, (e) complying with all company policies and procedures, and (f) actively promoting ethical behavior in the workplace.

Our governance programs and policies can be found on the Company's sustainability webpages, which are routinely updated and includes a description of our enterprise risk management program and our policies on child labor, human trafficking, anti-harassment, antibribery, and cybersecurity all of which are evaluated by third-parties, including EcoVadis. In addition, the investors pages of our website contain additional materials regarding our corporate governance process, including our Board committee charters, our corporate governance guidelines, our Code of Conduct, our Supplier Code of Conduct and other documents.

Additional Sustainability Information: Further information about our sustainability programs can be found on our website at https://www.ecovyst.com/sustainability/. The information available on our sustainability website includes our sustainability report, our sustainability goals (and how such goals map to the UN Sustainable Development Goals), materiality matrix, letters of assurance, Global Reporting Initiative (GRI) Disclosure and Sustainability Accounting Standards Board (SASB) Index, our Health Safety Environment & Security Policy Statement, our Corporate Code of Conduct, our Human Rights Policy Statement, a description of our Ethics & Compliance Complaint and Review Process and our Labor Policy. The further information contained on our website is not incorporated herein by reference and is not a part of this Annual Report on Form 10-K.

Environmental Regulations

We are subject to extensive, evolving and increasingly stringent national, state and/or local environmental laws and regulations, which address, among other things, the following:

- emissions to the air;
- discharges to soils and surface and subsurface waters;
- other releases into the environment;
- prevention and remediation of releases into the indoor or outdoor environment;
- generation, handling, storage, transportation, treatment and disposal of waste materials;
- maintenance of safe conditions in the workplace;
- registration and evaluation of chemicals;
- production, handling, labeling or use of chemicals used or produced by us; and
- stewardship of products after manufacture.

Again, we apply the principles of the Environmental Management standard of the International Organization for Standardization (ISO 14001) at our facilities throughout the world. For all of our facilities in the United States, we also adhere to the Responsible Care® RC14001 Technical Specifications of the American Chemistry Council.

We maintain policies and procedures to monitor and control HSE risks, and to monitor compliance with applicable local, state, national and international HSE requirements. We have a strong HSE organization. We maintain a staff of professionals who are responsible for environmental, safety, health, process safety and product regulatory compliance. We have implemented a corporate audit program for all of our facilities. However, we may not be in full compliance at all times with all applicable environmental laws and regulations. We expect that stringent environmental regulations will continue to be imposed on us and our industry in general. Evolving chemical regulation programs throughout the world could impose testing requirements or restrictions on our chemical raw materials and products.

Environmental Remediation

Environmental laws and regulations require mitigation or remediation of the effects of the disposal or release of chemical substances. Under some of these regulations, as the current or former owner or operator of a property, we could be held liable for the costs of removal or remediation of hazardous substances on or under property, without regard to whether we knew of or caused the contamination, and regardless of whether the practices that resulted in the contamination were permitted at the time they occurred. Many of our current or former production sites have an extended history of industrial use, and it is impossible to predict precisely what effect these laws and regulations will have on us in the future. Soil and groundwater contamination requiring investigation and remediation has been discovered at some of the sites, and might occur or be discovered at other sites. Several active and former facilities currently are undergoing investigation, remediation and/or surveillance, including sites in Dominguez, California, Martinez, California and Hammond, Indiana.

Environmental Programs

We have comprehensive HSE compliance, auditing and management programs in place to assist in our compliance with applicable regulatory requirements and with internal policies and procedures, as appropriate. Each facility has developed and implemented specific critical occupational health, safety, environmental, security and loss control programs.

We also have implemented a HSE organizational structure with executive committee level leadership and dedicated environmental experts. We have a Global Director of Health, Safety and Process Safety Management as well as Regional HSE Specialists and Managers who are embedded in the field and provide health and safety expertise and support to operating sites. We also have a Vice President of Environmental and Sustainability as well as Regional Environmental Specialists, Managers and Directors who are onsite to provide environmental expertise and support operating sites. Certain, larger sites may have dedicated environmental or health and safety personnel.

Product Safety and Product Stewardship

We have established a Product Safety and Product Stewardship management system that is compliant with the RC14001 technical specification and is supported by a highly skilled Director of Product Stewardship, who is a "Registration, Evaluation, Authorisation and Restriction of Chemicals" ("REACH") Specialist. We conduct Product Stewardship reviews as part of new product development and routinely evaluate product safety risk for raw materials, intermediates, and products.

As a chemical company, we are subject to extensive and evolving regulations regarding the manufacturing, processing, distribution, importing, exporting, and labeling of our products and raw materials. In the European Union, the REACH regulations came into effect in 2007, with implementation rolling out over time. Registered chemicals then can be subject to further evaluation and potential restrictions. Our high-volume chemicals have been registered under REACH; lower-volume chemicals (mainly catalysts) were registered by the applicable 2018 deadline. To date, no further testing has been required.

Since the promulgation of REACH, other countries have enacted or are in the process of implementing similar comprehensive chemical regulations. These programs include the Korea REACH law, which is requiring registration and potential testing of chemicals, and similar programs implemented in the UK, Taiwan, Turkey, India, and elsewhere. In the US, all pertinent chemicals have been designated as "active" under the US Frank R. Lautenberg Chemical Safety for the 21st Century Act. At this time, none have been designated as chemicals which the EPA will prioritize and evaluate for regulation. Based on our chemicals and the various regulations promulgated to date, we do not anticipate costly testing requirements nor severe restrictions, but cannot guarantee that we will not be subject to requirements for our products or raw materials that could materially affect our operations. In particular, some of our products might be characterized as nanomaterials and then be subject to evolving, new nanomaterial regulations.

We remain alert for any regulatory changes which may impact our products and their end uses.

Available Information

Our website address is www.ecovyst.com. We make available free of charge through our website our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities and Exchange Act of 1934, as amended ("Exchange Act"), as well as reports on Forms 3, 4 and 5 filed pursuant to Section 16 of the Exchange Act, as soon as reasonably practicable after such documents are electronically filed with, or furnished to, the Securities and Exchange Commission ("SEC"). The SEC maintains an Internet website, *https://www.sec.gov,* which contains reports, proxy and information statements, and other information regarding our Company and other issuers that file electronically with the SEC. The information on our website is not, and shall not be deemed to be, a part of this report or incorporated into any other filings we make with the SEC.

Our Corporate Governance Guidelines, Code of Business Conduct and the charters of the Audit Committee, Compensation Committee, Nominating and Corporate Governance Committee and Health, Safety and Environment Committee of our Board of Directors are also available on our website and are available in print to any shareholder upon request by writing to Ecovyst Investor Relations, 300 Lindenwood Drive, Malvern, PA 19355. In accordance with SEC rules, we intend to disclose any amendment (other than any technical, administrative or other non-substantive) to the Code of Business Conduct, or any waiver of any provision thereof with respect to any of our executive officers, on our website within four business days following such amendment or waiver.

ITEM 1A. RISK FACTORS.

In addition to the other information contained in this Form 10-K, you should carefully consider the following risks that we believe are the material risks that we face. The risks described below could have a material adverse impact on our business, financial condition, cash flows and results of operations, and should be read together and in conjunction with the forward-looking statements and "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in Item 7 of this Form 10-K, and our consolidated financial statements and the accompanying notes thereto.

Risks Related to Our Business Operations

As a global business, we are exposed to local business risks in different countries, which could have a material adverse effect on our financial condition, results of operations and cash flows.

We have operations in several countries, including manufacturing sites, research and development facilities, sales personnel and customer support operations. As of December 31, 2024, we operated ten manufacturing facilities. For the year ended December 31, 2024, our foreign subsidiaries accounted for 5% of our sales. Our operations are affected directly and indirectly by global regulatory, economic, political and social conditions, including:

- new and different legal and regulatory requirements in local jurisdictions;
- export duties or import quotas;
- domestic and foreign customs and tariffs or other trade barriers, including the threat of escalating trade disputes that may result in higher tariffs and the imposition of trade sanctions against certain countries, persons and entities;
- potential difficulties in staffing and labor disputes;
- potential difficulties in managing and obtaining support and distribution for local operations;
- increased costs of, and availability of, raw materials, energy, transportation or shipping;
- credit risk and financial condition of local customers and distributors;
- potential difficulties in protecting intellectual property rights;
- risk of nationalization of private enterprises by foreign governments;
- potential imposition of restrictions on investments;
- the imposition of withholding taxes or other taxes or royalties on our income, or the adoption of other restrictions on foreign trade or investment, including currency exchange controls;
- capital controls;
- potential difficulties in obtaining and enforcing legal judgments in jurisdictions outside the United States;
- potential difficulties in obtaining and enforcing relief in the United States against parties located outside the United States;
- potential difficulties in enforcing agreements and collecting receivables;
- risks relating to environmental, health and safety matters;
- regional conflicts, such as the invasion of Ukraine by Russia and the conflict involving Israel and Hamas and potentially other countries in the Middle East;
- risks relating to information security and cyber security events;
- risks relating to epidemics and pandemics and effects therefrom; and
- local political, economic and social conditions, including the possibility of hyperinflationary conditions and political instability in certain countries.

We may not be successful in developing and implementing policies and strategies to address the foregoing factors in a timely and effective manner at each location where we do business. Consequently, the occurrence of one or more of the foregoing factors could have a material adverse effect on our international operations or upon our financial condition, results of operations and cash flows.

Our operations and financial results have been and may continue to be adversely affected by general economic conditions.

We sell advanced materials, catalysts and services that are used in manufacturing processes and as components of, or ingredients in, other products and, as a result, our sales are correlated with and affected by fluctuations in the level of industrial production and manufacturing output and by fluctuations in general economic activity. Demand for the products we manufacture often depends on trends in demand in the end uses our customers serve. General economic conditions and macroeconomic trends, including economic recessions and inflation, could affect overall demand for our products and any overall decline in such demand could significantly reduce our sales and profitability. In addition, volatility and disruption in financial markets could adversely affect our sales and results of operations by limiting our customers' ability to obtain the financing necessary to maintain or expand their own operations.

Unfavorable global economic conditions could adversely affect our business, financial condition, and results of operations.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets. For example, during the past several years the global economy has experienced extreme volatility and disruptions, including significant volatility in commodity and market prices, including large fluctuations in energy prices, volatility in sulfur prices, declines in consumer confidence, declines in economic growth, supply chain interruptions, uncertainty about economic stability, record inflation globally, rising interest rates and the threat of recession. Unfavorable economic conditions could result in a variety of risks to our business, including demand and pricing for our products and difficulty in forecasting our financial results. A weak or declining economy also could strain our suppliers, possibly resulting in supply chain disruptions. In addition, inflation has increased our costs, which could impact our profitability. These and other economic factors could adversely impact our business and results of operations.

Exchange rate fluctuations could adversely affect our financial condition, results of operations and cash flows.

As a result of our international operations, for the year ended December 31, 2024, we generated 5% of our sales and associated expenses in currencies other than U.S. dollars. We incur currency transaction risk whenever we enter into either a purchase or sale transaction using a currency other than the local currency of the transacting entity. The main currencies to which we are exposed, besides the U.S. dollar, are the Euro and the British pound. The exchange rates between these currencies and the U.S. dollar have fluctuated significantly in recent years and may continue to do so in the future. In many cases, we sell exclusively in those jurisdictions and do not have the ability to mitigate our exposure to currency fluctuations through our operations. Accordingly, to the extent that we are unable to match sales made in such foreign currencies with costs paid in the same currency, exchange rate fluctuations could adversely affect our financial condition, results of operations and cash flows. In the past, we have experienced economic loss and a negative impact on earnings as a result of foreign currency exchange rate fluctuations and any future fluctuations may have similar impacts. We expect that the amount of our sales denominated in non-U.S. dollar currencies may increase in future periods. Given the volatility of exchange rates, we may not be able to effectively manage our currency transaction risks or that any volatility in currency exchange rates will not have a material adverse effect on our financial condition or results of operations. See "Management's Discussion and Analysis of Financial Condition and Results of Operations—Quantitative and Qualitative Disclosures about Market Risk."

Additionally, because our consolidated financial results are reported in U.S dollars, the translation of sales or earnings generated in other currencies into U.S. dollars can result in a significant increase or decrease in the amount of those sales or earnings in our financial statements, which also affects the comparability of our results of operations and cash flows between financial periods.

Our international operations require us to comply with anti-corruption laws, economic sanctions, export controls and similar laws and regulations of the U.S. government and various international jurisdictions in which we do business.

Doing business on a worldwide basis requires us and our subsidiaries to comply with the laws and regulations of the U.S. government and various international jurisdictions, and our failure to successfully comply with these laws and regulations may restrict our operations, trade practices, investment decisions and partnering activities and may expose us to liabilities. Such laws and regulations apply to companies, individual directors, officers, employees and agents.

In particular, our international operations are subject to U.S. and foreign anti-corruption laws and regulations, such as the Foreign Corrupt Practices Act ("FCPA") and the U.K. Bribery Act. For example, the FCPA prohibits us from providing anything of value to foreign officials for the purposes of influencing official decisions or obtaining or retaining business or otherwise obtaining favorable treatment, and requires us to maintain adequate record-keeping and internal accounting practices to accurately reflect our transactions. As part of our business, we may deal with state-owned business enterprises, the employees and representatives of which may be considered foreign officials for purposes of the FCPA. In addition, some of the international locations into which we sell our products lack a developed legal system and have elevated levels of corruption. As a result, we are exposed to corruption-related risk.

In addition, we are required to comply with applicable economic sanctions, export controls, and similar laws and regulations imposed by the U.S. government and other countries. These laws and regulations may restrict our business practices, or the counterparties or regions with which we can trade. In addition, these laws and regulations are subject to frequent change, and such changes may require us to adjust our business practices, including by ceasing business activities in newly sanctioned countries or regions or with newly sanctioned entities or individuals, or to modify our compliance program. For example, the invasion of Ukraine by Russia and the related sanctions, export controls or other actions that have been or may be initiated by nations—including the U.S., the European Union, the United Kingdom, and Russia—could disrupt or otherwise adversely impact our customers in those countries, as well as adversely impact our business or our supply chain, business partners or customers in other countries beyond Ukraine and Russia. Further, violations of these legal requirements are punishable by criminal fines and imprisonment, civil penalties, disgorgement of profits, injunctions, debarment from government contracts, loss of export privileges and other remedial measures.

We have established policies and procedures designed to assist us and our personnel in complying with applicable U.S. and international laws and regulations. These policies and procedures are codified in our Code of Conduct and other various policies. However, there can be no assurance that our policies and procedures will effectively prevent us from violating these laws and regulations in every transaction in which we may engage, and such a violation could subject us to governmental investigations and adversely affect our reputation, business, financial condition and results of operations.

Alternative technology or other changes in our customers' products may reduce or eliminate the need for certain of our products.

Many of the products that we sell are used in manufacturing processes and/or to produce other products and, as a result, changes in our customers' end products or processes or alternative technologies may enable our customers to reduce or eliminate consumption or use of our products. Additionally, shifting consumer preference could result in a significant reduction in the future use of fossil fuels, which would have a negative impact on our zeolite catalysts and Ecoservices businesses. If we are unable to respond appropriately to such new developments, such changes could seriously impair our ability to profitably market certain of our products.

Our new product development and research and development efforts may not succeed and our competitors may develop more effective or successful products.

The industries in which we operate are subject to periodic technological changes and ongoing product improvements. In order to maintain our margins and remain competitive, we must successfully develop, manufacture and market new or improved products. As a result, we must commit substantial resources each year to new product research and development. Ongoing investments in new product research and development could result in higher costs without a proportional increase in revenues. Additionally, for any new product program, there is a risk of technical or market failure, in which case we may need to commit additional resources to the program and may not be able to develop the new products needed to maintain our competitive position. Moreover, new products may have lower margins than the products they replace or may not successfully attract end users.

We also expect competition to increase as our competitors develop and introduce new and enhanced products. As such products are introduced, our products may become obsolete or our competitors' products may be marketed more effectively. If we fail to develop new products, maintain or improve our margins with our new products or keep pace with technological developments, our business, financial condition, results of operations and cash flows will suffer.

If we are unable to pass on increases in raw material prices, including natural gas, to our customers or to retain or replace our key suppliers, our results of operations and cash flows may be negatively affected.

We purchase significant amounts of raw materials, including precursor products in our Advanced Materials & Catalysts business and sulfur in our Ecoservices business, and we purchase significant amounts of natural gas to supply the energy required in our production process. The cost of these raw materials represents a substantial portion of our operating expenses and our results of operations have been, and could in the future be, significantly affected by increases in the costs of such raw materials. In addition, we obtain a significant portion of our raw materials from certain key suppliers. If any of those suppliers is unable to meet its obligations under current or future supply agreements, we may be forced to pay higher prices to obtain the necessary raw materials. Furthermore, if any of the raw materials that we use become unavailable within the geographic area from which we currently source them, we may not be able to obtain suitable and cost-effective substitutes. Any interruption of supply or any price increase of raw materials could adversely affect our profitability.

While we attempt to match raw material price increases with corresponding product price increases, our ability to pass on increases in the cost of raw materials to our customers is, to a large extent, dependent upon our contractual arrangements and market conditions. There may be periods of time during which we are not able to recover increases in the cost of raw materials due to our contractual arrangements or weakness in demand for, or oversupply of, our products. Specifically, timing differences between price adjustments of raw materials and adjustments to our product prices, which in many cases are adjusted quarterly or less often, have had and may continue to have a negative effect on our profitability. Even in periods during which raw material prices decline, we may suffer decreasing profits if customers seek relief in the form of lower sales prices or if the raw material price reductions occur at a slower rate than decreases in the selling prices of our products. Such volatility can result in commercial disputes with customers and suppliers with respect to interpretations of complex contractual arrangements, the adverse resolution of which could reduce our profitability.

In the past, we have entered into long-term supply contracts for certain of our raw materials. As these contracts expire, we may not be able to renegotiate or enter into new long-term supply contracts that will offer similar protection from price increases and other fluctuations on terms that are satisfactory to us or at all.

We face substantial competition in the industries in which we operate.

Our Advanced Materials & Catalysts segment primarily competes with other global producers in the petrochemicals and refining industries such as Grace, BASF, UOP, and Albemarle, as well as other niche competitors such as Tosoh, Axens, and Haldor Topsoe. In our Ecoservices segment, we compete in the North American refining services industry with competitors such as Chemtrade and Nexpera, formerly the sulfuric acid business of Veolia. We believe that we typically compete on the basis of performance, product consistency, quality, reliability, and ability to innovate in response to customer demands.

Our competitors may improve their competitive position in our core end use applications by successfully introducing new products, improving their manufacturing processes, expanding their capacity or manufacturing facilities or responding more effectively than we do to new or emerging technologies and changes in customer requirements. Some of our competitors may be able to lower prices for products that compete with our products if their costs are lower. In addition, consolidation among our competitors or customers may result in reduced demand for our products or make it more difficult for us to compete. Some of our competitors' financial, technological and other resources may be greater than ours or they may have less debt than we do and, as a result, may be better able to withstand changes to industry conditions. The occurrence of any of these events could materially adversely affect our financial condition and results of operations.

We are subject to the risk of loss resulting from non-payment or non-performance by our customers.

Our credit procedures and policies may not be adequate to minimize or mitigate customer credit risk. Our customers may experience financial difficulties, including bankruptcies, restructurings and liquidations. These and other financial problems our customers may experience, as well as potential financial weakness in the industries in which we operate or general economic conditions, may increase our risk in extending trade credit to customers. A significant adverse change in a customer's financial position could cause us to limit or discontinue business with such customer, require us to assume more credit risk relating to such customer's receivables or limit our ability to collect accounts receivable from such customer, any of which could have a material adverse effect on our business, results of operations, financial condition and liquidity.

We rely on a limited number of customers for a meaningful portion of our business. A loss of one or more of these customers could adversely impact our profitability.

A loss of any significant customer, including a pipeline customer in our Ecoservices segment, or a decrease in the provision of products to any significant customer, could have an adverse effect on our business until alternative arrangements are secured. Any alternative arrangement to replace the loss of a customer could result in increased variable costs relating to product shipment. In addition, any new customer agreement we enter into may not have terms as favorable as those contained in our current customer agreements, which could have a material adverse effect on our business, financial condition and results of operations. For the year ended December 31, 2024, our top ten customers represented approximately 60% of our sales and one single customer represented 14% or $96 million of our sales in both Ecoservices and Advanced Materials & Catalysts.

Refineries, which represent a sizable subset of our Ecoservices segment customer base, have undergone significant consolidation and additional consolidation is possible in the future. Such consolidation could further increase our reliance on a small number of customers and further increase our customers' leverage over us, resulting in downward pressure on prices and an adverse effect on our profitability.

Multi-year customer contracts in our Ecoservices segment are subject to potential early termination and such contracts may not be renewed at the end of their respective terms.

Many of the customer contracts in our Ecoservices segment are multi-year agreements. Regeneration services customer contracts are typically on five- to ten-year terms and virgin sulfuric acid customer contracts are typically on one- to five-year terms, with larger customers typically favoring longer terms. Excluding contracts with automatic evergreen provisions, approximately 40% of our sulfuric acid volume for the year ended December 31, 2024 was under contracts expiring at the end of 2025 or beyond. In addition, our regeneration services contracts with major refinery customers typically allow for termination with advance notice of one to two years. We cannot provide assurance that our existing contracts will not be subjected to early terminations or that our expiring contracts will be renewed at the end of their terms. If we receive a significant number of such contract terminations or experience non-renewals from key customers in our Ecoservices segment, our results of operations, financial condition and cash flows may be materially adversely affected.

Our quarterly results of operations are subject to fluctuations because the demand for some of our products is seasonal.

Our Ecoservices segment typically experiences seasonal fluctuations as a result of higher demand for gasoline products in the summer months. Because of the seasonality of some of our product groups, the results for any one quarter are not necessarily indicative of the results that may be achieved for any other quarter or for the full year.

Our growth projects may result in significant expenditures before generating revenues, if any, which may materially and adversely affect our ability to implement our business strategy.

We have made and continue to make significant investments in each of our businesses. These projects require us to commit significant capital to, among other things, implement engineering plans and obtain the necessary permits before we generate revenues related to our investments in these businesses. Such projects may take longer to complete or require additional unanticipated expenditures and may never generate profits. If we fail to recover our investment, or these projects never become profitable, our ability to implement our business strategy may be materially and adversely affected.

We may be liable for damages based on product liability claims brought against us or our customers for costs associated with recalls of our or our customers' products.

Even though we are generally an advanced materials and services supplier rather than a manufacturer of finished goods, the sale of our products involves the risk of product liability claims and voluntary or government-ordered product recalls. For example, certain of the products that we manufacture are used in chemical manufacturing processes in our customers' manufacturing operations and are used in and around other chemical manufacturing facilities and other locations where personal injury or property damage may occur. While we attempt to protect ourselves from product liability claims and exposures through our adherence to standards and specifications, quality control and assurance and through contractual negotiations and provisions, there can be no assurance that our efforts will ultimately protect us from such claims. A product liability claim or voluntary or government-ordered product recall could result in substantial and unexpected expenditures, affect customer confidence in our products and divert management's attention from other responsibilities. A product recall or successful product liability claim or series of claims against us in excess of our insurance coverage and for which we are not otherwise indemnified could have a material adverse effect on our business, financial condition, results of operations or cash flows. We have product liability insurance in amounts that we believe are adequate to cover this product liability risk. However, our insurance may not provide adequate coverage against all potential liabilities, including product recall liabilities. If a claim is brought against us, we might be required to pay legal and other expenses to defend the claim, as well as pay uncovered damage awards resulting from a claim brought successfully against us and these damages could be significant and have a material adverse effect on our financial condition. Furthermore, whether or not we are ultimately successful in defending any such claims, we might be required to direct significant financial and managerial resources to such defense and adverse publicity is likely to result.

We are required to comply with a wide variety of laws and regulations, and are subject to regulation by various federal, state and foreign agencies, and our failure to comply with existing and future regulatory requirements could adversely affect our financial condition, results of operations and cash flows.

We compete in industries in which we and our customers are subject to federal, state, local, international and transnational laws and regulations. Such laws and regulations are numerous and sometimes conflicting, and any future changes to such laws and regulations could adversely affect us.

In order to obtain regulatory approval for certain of our new products, we must, among other things, demonstrate to the relevant authority that the product is safe and effective for its intended uses and that we are capable of manufacturing the product in accordance with current regulations. The process of seeking approvals can be costly, time-consuming and subject to unanticipated and significant delays. Any delay in obtaining, or any failure to obtain or maintain, these approvals would adversely affect our ability to introduce new products and to generate sales from those products, and could have an adverse effect on our business, financial condition, results of operations or cash flows.

Our products, including the raw materials we handle, are subject to rigorous chemical registration and industrial hygiene regulations and investigation. There is risk that a key raw material, chemical or substance, or one of the end products of which our products are a part of or are utilized to make, may be recharacterized as having a toxicological or health-related impact on the environment, our customers or our employees. Industrial hygiene regulations are continually strengthened and if such recharacterization occurs, the relevant raw material, chemical or product may be banned or we may incur increased costs in order to comply with new requirements. Changes in industrial hygiene regulations also affect the marketability of certain of our products, and future regulatory changes may have a material adverse effect on our business.

New laws and regulations, and changes in existing laws and regulations, may become effective in the future and could prevent or inhibit the development, distribution and sale of our products, including, but not limited to, the imposition of additional compliance costs, seizures, confiscation, recall or monetary fines. For example, as discussed in more detail in "Business-Environmental Regulations" and "Business-Chemical Product Regulation," we may be materially impacted by regulatory initiatives worldwide with respect to chemical product safety such as the 2016 amendments to the U.S. Toxic Substances Control Act, the E.U. REACH regulation, and/or similar regulations being enacted in other countries (e.g., China REACH; Korea REACH). Additionally, current or future U.S. administrations may seek to alter current environmental standards and regulations, including, but not limited to, the Corporate Average Fuel Economy standards, which could have a material adverse effect on our sales into the clean fuels, emission control and other industries.

We are subject to extensive environmental, health and safety regulations and face various risks associated with potential non-compliance or releases of hazardous materials.

Like other chemical companies, our operations and properties are subject to extensive and stringent federal, state, local and foreign environmental laws and regulations. U.S. federal environmental laws that affect us include, but are not limited to, the Resource Conservation and Recovery Act ("RCRA"), the Clean Air Act, the Clean Water Act and the Comprehensive Environmental Response Compensation and Liability Act ("CERCLA"). These laws govern, among other things, emissions to the air, discharges or releases of hazardous substances to land, surface, subsurface strata and water, wastewater discharges and the generation, handling, storage, transportation, treatment, disposal and remediation of hazardous materials and petroleum products. We are also subject to other federal, state, local and foreign laws and regulations regarding chemical and product safety as well as employee health and safety matters, including process safety requirements. These laws and regulations may become more stringent over time and the failure to comply with such laws and regulations can result in significant fines or penalties.

We have in the past been and currently are the subject of investigations and enforcement actions pursuant to environmental laws, including the Clean Air Act. Some of these matters were resolved through the payment of significant monetary penalties and a requirement to implement corrective actions at our facilities. For instance, we remain subject to a 2007 Consent Decree that resolves certain alleged Clean Air Act violations at six Ecoservices operating locations involving New Source Review, Prevention of Significant Deterioration and New Source Performance Standard obligations under the U.S. federal rules for the pollutants sulfur dioxide and sulfuric acid mist. The Consent Decree required Solvay (the owner of such facilities at the time) to pay a $2 million penalty and spend approximately $34 million on air pollution controls at our facilities, the majority of which was received from customers in contractual arrangements. Work under the Consent Decree has proceeded since 2007, and all of the significant capital improvements related to the Consent Decree have been completed. Three of our operating locations have been released from the scope of the Consent Decree and we are seeking release of three other locations covered by the Consent Decree. Upon issuance of New Source Review permit amendments at the remaining sites, we expect to be fully released from the Consent Decree.

We are required by these environmental laws and regulations to obtain registrations, licenses, permits and other approvals in order to operate, make disclosures to public authorities about our chemical handling and usage activities and install expensive pollution control and spill containment equipment at our facilities, or incur other capital expenditures aimed at achieving or maintaining compliance with such laws and regulations. The failure to timely identify and implement any such capital projects required to achieve or maintain compliance could expose us to enforcement and penalty.

Under CERCLA and analogous statutes in local and foreign jurisdictions, current and former owners and operators of land impacted by releases of hazardous substances are strictly liable for the investigation and remediation of the contamination resulting from the release. Liability under CERCLA and analogous laws is strict, unlimited, joint, several and retroactive, may be imposed regardless of fault and may relate to historical activities or contamination not caused by the affected property's current owner or operator. We could be held responsible for all cleanup costs at a site, whether currently or formerly owned or operated, regardless of fault, knowledge, timing or cause of the contamination. Further, under CERCLA and analogous laws, we may be jointly and severally liable for contamination at third party sites where we or our predecessors in interest have sent waste for treatment or disposal, even if we complied with applicable laws. In addition, we may face liability for personal injury, property damage and/or natural resource damage resulting from environmental conditions attributable to hazardous substance releases at or from facilities we currently own or operate or formerly owned or operated or to which we sent waste. As such, a product spill or emission at one of our facilities or otherwise resulting from our operations could have adverse consequences on the environment and surrounding community and could result in significant liabilities with respect to investigation and remediation.

Our facilities have an extended history of industrial use, and soil and groundwater contamination exists at some of our sites. As of December 31, 2024, we had current remediation, monitoring and/or maintenance obligations at several of our current or former sites, including Dominguez, California, Martinez, California and Hammond, Indiana. As of December 31, 2024, we had established reserves to cover anticipated expenses at these sites, all of which have reached relatively mature stages of the investigation, remediation or monitoring process. Actual costs to complete these projects may exceed our current estimates.

As of December 31, 2024, our total reserves associated with environmental remediation and enforcement matters noted above were $0.8 million. In addition to the ongoing remediation and monitoring activities discussed above, there is risk that the long-term industrial use at our facilities may have resulted in, or may in the future result in, contamination that has yet to be discovered, which could require additional, unplanned investigation and remediation efforts by us for which no reserves have been established, potentially without regard to whether we knew of, or caused, the release of such contaminants. Discovery of additional or unknown conditions at our facilities could have an adverse impact on our business by substantially increasing our capital expenditures, including compliance, investigation and remediation costs. Such environmental liabilities attached to our properties, or for properties that we are otherwise responsible for, could have a material adverse effect on our results of operations or financial condition.

Existing and proposed regulations to address climate change by limiting greenhouse gas emissions may cause us to incur significant additional operating and capital expenses and may impact our business and results of operations.

Certain of our operations result in emissions of GHG, such as carbon dioxide. Growing concern about the sources and impacts of global climate change has led to a number of domestic and foreign legislative and administrative measures, both proposed and enacted, to monitor, regulate and limit carbon dioxide and other GHG emissions. In the European Union, our emissions are regulated under the E.U. Emissions Trading System (the "E.U. ETS"), an E.U.-wide trading scheme for industrial GHG emissions. The E.U. ETS is anticipated to become progressively more stringent over time, including by reducing the number of allowances to emit GHG that E.U. member states will allocate without charge to industrial facilities. In the United States, the EPA has promulgated federal GHG regulations under the Clean Air Act that affect certain sources. For example, the EPA has issued mandatory GHG reporting requirements, under which some of our Ecoservices' facilities report depending upon each facility's natural gas usage during each prior reporting year. Moreover, California has enacted the Global Warming Solutions Act of 2006 ("Assembly Bill 32"), a law that establishes a comprehensive program to reduce GHG emissions from all sources throughout the state and contains reporting requirements under which our Dominguez and Martinez facilities currently report. Our Dominguez facility also participates in the emissions trading market established under Assembly Bill 32. Although we believe it is likely that GHG emissions will continue to be regulated in at least some regions of the United States and in other countries (in addition to the European Union) in the future, we cannot yet predict the form such regulation will take (such as a cap-and-trade program, technology mandate, emissions tax or other regulatory mechanism) or, consequently, estimate the costs that we may be required to incur to meet such requirements, which could, for example, require that we install emission control equipment, purchase emissions allowances, administer and manage our GHG emissions program or address other regulatory obligations. Such requirements could also adversely affect our energy supply or the costs and types of raw materials that we use for fuel. Accordingly, regulations controlling or limiting GHG emissions could have a material adverse effect on our business, financial condition or results of operations, including by reducing demand for our products.

Sustainability initiatives may result in operational changes and expenditures, reduced demand for our products and adversely affect our business.

We recognize that sustainability is a growing global environmental concern. Continuing political and social attention to the issue of sustainability has resulted in both existing and pending international agreements and national, regional or local legislation and regulatory measures to increase sustainability. As a result of heightened public awareness and attention to the issue of sustainability as well as continued regulatory initiatives, demand for certain of our products may be reduced, which may have an adverse effect on our sales volumes, revenues and margins.

This growing global environmental concern is also manifesting in existing and pending sustainability legislation, regulations, and directives at the federal, state and international levels, including, but not limited to, the E.U. Corporate Sustainability Reporting Directive ("CSRD"), the California Climate Corporate Data Accountability Act (SB 253) and GHG Climate-related Financial Risk Act (SB 261), and the stayed United States SEC rules addressing Scope 1 and 2 emissions. In the future, these developments are anticipated to increase the cost associated with complying with existing, pending, and future sustainability-related legislation, regulations and directives and such increased costs and/or our failure to comply with any such legislation, regulations and directives could adversely affect our financial condition, results of operations and cash flows.

Production and distribution of our products could be disrupted for a variety of reasons, and such disruptions could expose us to significant losses or liabilities.

Certain of the hazards and risks associated with our manufacturing processes and the related storage and transportation of raw materials, products and wastes may disrupt production at our manufacturing facilities and the distribution of products to our customers. These potentially disruptive risks include, but are not limited to, the following:

- pipeline and storage tank leaks and ruptures;
- explosions and fires;
- inclement weather and natural disasters;
- terrorist attacks;
- failure of mechanical, process safety and pollution control equipment;
- chemical spills and other discharges or releases of toxic or hazardous substances or gases;
- epidemics and pandemics and effects therefrom; and
- exposure to toxic chemicals.

These hazards could expose employees, customers, the community and others to toxic chemicals and other hazards, contaminate the environment, damage property, result in personal injury or death, lead to an interruption or suspension of operations, damage our reputation and adversely affect the productivity and profitability of a particular manufacturing facility or our business as a whole. Such hazards could also result in the need for remediation, governmental enforcement, regulatory shutdowns, the imposition of government fines and penalties and claims brought by governmental entities or third parties. Legal claims and regulatory actions could subject us to both civil and criminal penalties, which could affect our product sales, reputation and profitability.

If disruptions at our manufacturing facilities or in our distribution channels occur, alternative options with sufficient capacity or capabilities may not be available, may cost substantially more or may require significant time to start production or distribution. Any of these scenarios could negatively affect our business and financial performance. If one of our manufacturing facilities or distribution channels is unable to produce or distribute our products for an extended period of time, our sales may be reduced by the shortfall caused by the disruption and we may not be able to meet our customers' needs, which could cause them to seek other suppliers. Furthermore, to the extent a production disruption occurs at a manufacturing facility that has been operating at or near full capacity, the resulting shortage of our product could be particularly harmful because production at the manufacturing facility may not be able to reach levels achieved prior to the disruption. Such risks are heightened in our Ecoservices segment, which has operations and customers primarily located in the Gulf Coast, which is susceptible to a heightened risk of hurricanes, and in California, which is susceptible to a heightened risk of earthquakes and wildfires. For example, in December 2022, the operations of our Ecoservices' Houston and Hammond facilities were disrupted by Winter Storm Elliot.

The insurance that we maintain may not fully cover all potential exposures.

We maintain property, business interruption, casualty and other types of insurance, but such insurance may not cover all risks associated with the operation of our business or our manufacturing process and the related use, storage and transportation of raw materials, products and wastes in or from our manufacturing sites or distribution centers. While we have purchased what we deem to be adequate limits of coverage and broadly worded policies, our coverage is subject to exclusions and limitations, including higher self-insured retentions or deductibles and maximum limits and liabilities covered. Notwithstanding diligent efforts to successfully procure specialty coverage for environmental liability and remediation, we may incur losses beyond the limits or outside the terms of coverage of our insurance policies, including liabilities for environmental remediation. In addition, from time to time, various types of insurance for companies in the industries in which we operate have not been available on commercially acceptable terms or, in some cases, at all. We are potentially at additional risk if one or more of our insurance carriers fail. Additionally, severe disruptions in the domestic and global financial markets could adversely impact the ratings and survival of some insurers. Future downgrades in the ratings of enough insurers could adversely impact both the availability of appropriate insurance coverage and its cost. In the future, we may not be able to obtain coverage at current levels, if at all, and our premiums may increase significantly on coverage that we maintain.

We could be subject to damages based on claims brought against us by our customers or lose customers as a result of the failure of our products to meet certain quality specifications.

If a product fails to perform in a manner consistent with quality specifications, or has a shorter useful life than that which was guaranteed, a customer could seek replacement of the product or damages for costs incurred as a result of the product failing to perform as guaranteed. A successful claim or series of claims against us could cause reputational harm and have a material adverse effect on our financial condition and results of operations and could result in a loss of one or more customers.

We may engage in strategic acquisitions or dispositions of certain assets or businesses that could affect our business, results of operations, financial condition and liquidity.

We may selectively pursue complementary acquisitions, such as the Chem32 acquisition, and joint ventures, such as the Zeolyst Joint Venture, each of which inherently involves a number of risks and presents financial, managerial and operational challenges, including:

- potential disruption of our ongoing business and distraction of management;
- difficulty with integration of personnel and financial and other systems;
- hiring additional management and other critical personnel; and
- increasing the scope, geographic diversity and complexity of our operations.

In addition, we may encounter unforeseen obstacles or costs in the integration of acquired businesses. For example, the presence of one or more material liabilities of an acquired company that are unknown to us at the time of acquisition may have a material adverse effect on our business. Our acquisition and joint venture strategy may not be received positively by customers, and we may not realize any anticipated benefits from acquisitions or joint ventures.

We may also opportunistically pursue dispositions of certain assets and businesses, which may involve material amounts of assets or lines of business, which could adversely affect our results of operations, financial condition and liquidity. We are currently conducting a strategic review of our Advanced Materials & Catalysts segment, which may or may not result in a disposition involving all or a part of that segment. If any such dispositions were to occur, under the terms of the agreements governing our outstanding indebtedness, we may be required to apply the proceeds of the sale to repay such indebtedness.

In addition, our strategic acquisitions and dispositions may also affect the diversity of our assets and our capital structure. As a result, our acquisitions and dispositions could affect our business, results of operations, financial condition, and liquidity. Further, all the risks associated with our acquisitions and dispositions may not be immediately known to us, and the anticipated benefits of such acquisition or disposition may not be fully realized.

Effective on August 1, 2021, we completed the sale of our Performance Chemicals business to Cerberus Capital Management, L.P. and Koch Mineral & Trading LLC for a purchase price of $1.1 billion, which was subject to certain adjustments including for indebtedness, cash, working capital and transaction expenses at the closing of the transaction.

Our strategic review process for the Advanced Materials & Catalyst business may not result in the identification or completion of a transaction, or create additional value for our stockholders, and the process may have an adverse effect on our business.

On December 2, 2024, the Company announced that the Board of Directors had initiated a strategic review process for its Advanced Materials & Catalysts business. At this time, the Board has not made any decisions as to whether the strategic review process will result in any transaction or any other outcome. We cannot make any assurance that the Board's review will result in a transaction or other strategic change to the Company or its Advanced Materials & Catalysts business, happen on the timeline we anticipate or that the outcome of the review will provide greater value to our stockholders than the current price of our common stock. The strategic review process may require significant resources and expenses. In addition, speculation and uncertainty regarding the strategic review process may cause or result in disruption of our business; distraction of our employees; difficulty in recruiting, hiring, motivating and retaining qualified personnel; difficulty in maintaining or negotiating and consummating new business or strategic relationships or transactions; potential litigation; and increased stock price volatility. If we are unable to mitigate these or other potential risks related to the uncertainty caused by the strategic review process, it may adversely affect our business or adversely impact our business, financial condition, results of operations and cash flows.

Our joint ventures may not operate according to their business plans if our partners fail to fulfill their obligations or differences in views among our partners results in delayed decisions or failures to agree on major issues, which may adversely affect our results of operations and force us to dedicate additional resources to these joint ventures.

We currently participate in a joint venture relating to the Zeolyst International business and may enter into additional joint ventures in the future. The nature of a joint venture requires us to share control with unaffiliated third parties and we sometimes have joint and several liability with our joint venture partners. If our joint venture partners do not fulfill their obligations, or if differences in views among the joint venture participants result in delayed decisions or failures to agree on major issues, the affected joint venture may not be able to operate according to its business plan. For example, the Zeolyst Joint Venture is structured as a general partnership in which we are an equal partner with Shell. Accordingly, we do not control the Zeolyst Joint Venture and generally cannot unilaterally undertake strategies, plans, goals and operations or determine when cash distributions will be made to us. Furthermore, we are liable on a joint and several basis with Shell for all of the partnership's liabilities if it does not have sufficient assets to satisfy such liabilities. Such factors may adversely affect our results of operation and force us to dedicate additional and unexpected resources to our joint ventures.

Our failure to protect our intellectual property rights could adversely affect our future performance and growth.

Protection of our proprietary processes, methods, compounds and other technologies is important to our business. We depend upon our ability to develop and protect our intellectual property rights to distinguish our products from those of our competitors. Failure to protect our existing intellectual property rights may allow our competitors to copy our products and may result in the loss of valuable proprietary technologies or other intellectual property. Failure to protect our innovations and trademarks by securing intellectual property rights could also result in our having to pay other companies for infringing on their intellectual property rights. We rely on a combination of patent, trade secret, trademark and copyright law as well as regulatory and judicial enforcement to protect such technologies and trademarks. In addition, the laws of many foreign countries do not protect our intellectual property rights to the same extent as the laws of the United States. As of December 31, 2024, we owned 22 patented inventions in the United States, with 169 patents issued in countries around the world and 63 patent applications pending worldwide covering such inventions. Some of these patents are licensed to others. In addition, we have acquired certain rights under patents and inventions of others through licenses. Should any of these licenses granted to us by third parties terminate prior to the expiration of the licensed intellectual property, we would need to cease using the licensed intellectual property, and either develop or license alternative technologies. In such a case, there can be no assurance that alternative technologies exist or that we would be able to obtain such a license on favorable terms.

Competitors and third parties may infringe on our patents or violate our intellectual property rights. Defending and enforcing our intellectual property rights can involve litigation and can be expensive and time consuming. Such proceedings could put our patents at risk of being invalidated and confidential information may be disclosed through the discovery process; these costs and diversion of resources could harm our business.

We cannot provide any assurances that any of our pending applications will mature into issued patents, or that any patents that have issued or may issue in the future do or will include claims with a scope sufficient to provide any competitive advantage. Patents involve complex legal and factual questions and, therefore, the issuance, scope, validity and enforceability of any patent claims we have or may obtain cannot be predicted with certainty. Patents may be challenged, deemed unenforceable, invalidated or circumvented. Patents may be challenged in the courts, as well as in various administrative proceedings before the United States Patent and Trademark Office or foreign patent offices. We are currently and may in the future be a party to various adversarial patent office proceedings involving our patents or the patents of third parties. Such challenges can result in some or all of the claims of the challenged patent being invalidated, deemed unenforceable, or interpreted narrowly which, in the case of challenges to our own patents, may be adverse to our interests. Accordingly, the issuance of patents is not conclusive of the validity, scope, or enforceability of such patents. Moreover, even if valid and enforceable, competitors may be able to design around our patents or use pre-existing technologies to compete with us.

We also rely upon unpatented proprietary know-how, continuing technological innovation and other trade secrets to develop and maintain our competitive position, which may not provide us with complete protection against competitors. Misappropriation or unauthorized disclosure of our proprietary know-how could harm our competitive position or have an adverse effect on our business. While it is our policy to enter into confidentiality agreements with our employees and third parties to protect our intellectual property rights and we strive to maintain the physical security of our properties and the security of our IT systems, there can be no assurances that:

- our confidentiality agreements will not be breached;
- our security measures will not be breached;
- such agreements will provide meaningful protection for our trade secrets or proprietary know-how; or
- adequate remedies will be available in the event of an unauthorized use or disclosure of such trade secrets and know-how.

In addition, there can be no assurances that others will not obtain knowledge of these trade secrets through independent development or other access by legal means.

Measures taken by us to protect these assets and rights may not provide meaningful protection for our trade secrets or proprietary manufacturing expertise and adequate remedies may not be available in the event of an unauthorized use or disclosure of our trade secrets or manufacturing expertise. In addition, as noted above, our patents and other intellectual property rights may be challenged, invalidated, circumvented or rendered unenforceable.

Furthermore, we cannot provide assurance that any pending patent or trademark application filed by us will result in an issued patent or registered trademark or, if patents are issued to us, that those patents will provide meaningful protection against competitors or against competitive technologies. The failure of our patents or other measures to protect our processes, apparatuses, technology, trade secrets and proprietary manufacturing expertise, methods and compounds or trademarks and provide us with freedom to exclude competition could have an adverse effect on our business, financial condition, results of operations and cash flows. See "Business-Intellectual Property."

Our products may infringe the intellectual property rights of others, which may cause us to incur unexpected costs or prevent us from selling our products.

Our industry is characterized by vigilant pursuit of intellectual property rights, particularly with respect to our advanced silicas and zeolite catalysts product groups. Like us, our competitors rely on intellectual property rights to maintain profitability and competitiveness. As the number of products and competitors has increased, the likelihood of intellectual property disputes has risen. Although it is our policy and intention not to infringe valid patents of others, our processes, apparatuses, technology, proprietary manufacturing expertise, methods, compounds and products may infringe on issued patents or infringe or misappropriate other intellectual property rights of others. Accordingly, we continually monitor third-party intellectual property to confirm our freedom to operate. Nevertheless, we may be subject to legal proceedings and claims in the ordinary course of our business, including claims of alleged infringement of the patents or trademarks or infringement or misappropriation of other intellectual property rights of third parties by us or our licensees in connection with their use of our products. Intellectual property litigation is expensive and time-consuming, regardless of the merits of any claim, and could divert the attention of our management and technical personnel away from operating our business. If we were to discover that our processes, apparatuses, technology, products or trademarks infringe the valid intellectual property rights of others, we might need to obtain licenses from these parties or substantially reengineer or rebrand our products in order to avoid infringement. We may not be able to obtain the necessary licenses on acceptable terms, or at all, or be able to reengineer our products successfully or at an acceptable cost. Moreover, if we are sued for infringement and lose the suit, we could be required to pay substantial damages and/or be enjoined from using or selling the infringing products or technology or using the infringing trademark. Additionally or alternatively, we may seek to challenge third-party patents in administrative proceedings before the United States patent office or one or more foreign patent offices. Any of the foregoing could cause us to incur significant costs and prevent us from selling our products, which could have an adverse effect on our business, financial condition, results of operations and cash flows. Even if we ultimately prevail, the existence of lawsuits could prompt our customers to switch to alternative products. In addition, we have agreed, and will continue to agree, to indemnify certain customers for certain intellectual property infringement claims related to intellectual property relating to our products and the manufacture thereof. Should there be infringement claims against our licensees, we could be required to indemnify them for losses resulting from such claims or to refund amounts they have paid to us.

Disruption, failure or cybersecurity breaches affecting or targeting computers and infrastructure used by us or our business partners may adversely impact our business and operations.

We use computers and telecommunication systems to analyze and store financial and operating data and to communicate within our company, with outside business partners, and across international borders. These systems can be subject to technical system flaws; power loss; cyber attacks, including viruses, malware, phishing, ransomware, terrorism, and surveillance; unauthorized access; malicious software; intentional or inadvertent data privacy breaches by employees or others with authorized access; hacktivism; ransomware; physical or electronic break-ins; fires or natural disasters; supply chain attacks; and other cybersecurity issues. We have no assurance that our systems are appropriately redundant to withstand these events. Accordingly, such events could cause adverse effects and material disruptions to our operations or systems or those of our business partners; compromise the security, integrity, availability, and confidentiality of customer information, employee information, strategic projects, product formulas and other trade secrets, other business or personal sensitive data, including third party confidential information in our possession. Release of third party confidential information could materially harm our reputation, affect our relationships with such parties and expose us to liability. Although we have introduced many security measures, including firewalls and information technology security policies and training, these measures may not offer the appropriate level of security. A security breach or other compromise of our information security safeguards could expose our confidential information, including third party confidential information in our possession (such as customer information) to theft and misuse, which could in turn adversely affect our relationships with such third parties and have an adverse effect on our business, financial condition, results of operations and cash flows. In addition, a disruption, blockage, failure or a cyber breach of software or operating systems we use, or of the networks and infrastructure on which they rely, could damage critical production, distribution and/or storage assets, delay or prevent delivery to markets, and make it difficult or impossible to accurately account for production and settle transactions.

These impacts may adversely affect our relationships with employees, customers and other third parties and may have an adverse effect on our business reputation, competitiveness, financial condition, results of operations and cash flows, including damage to our operations, employees, or other third parties, resulting in remediation costs, litigation or regulatory actions. Although we have introduced many security measures, including firewalls and information technology security policies and training, these measures may not offer the appropriate level of security. We routinely experience attempts by external parties to penetrate and attack our networks and systems. Although such attempts to date have not resulted in any material breaches, disruptions, financial loss, or loss of business-critical information, our systems and procedures for protecting against such attacks and mitigating such risks may prove to be insufficient in the future. As technologies evolve and these cyber security attacks become more sophisticated, we may incur significant costs to upgrade or enhance our security measures to protect against such attacks, and we may face difficulties in fully anticipating or implementing adequate preventive measures or mitigating potential harm.

Risks Related to our Financial Condition

The non-GAAP financial information included in this Form 10-K is presented for informational purposes only and may not be an indication of our financial condition or results of operations in the future.

The non-GAAP financial information included in this Form 10-K includes information that we use to evaluate our past performance, but should not be considered in isolation or as an alternative to measures of our performance determined under GAAP.

Because our operations are conducted through our subsidiaries and joint ventures, we are dependent on the receipt of distributions and dividends or other payments from our subsidiaries and joint ventures for cash to fund our operations and expenses, including to make future dividend payments, if any.

Our operations are conducted through our subsidiaries and joint ventures. As a result, our ability to make future dividend payments, if any, is dependent on the earnings of our subsidiaries and joint ventures and the payment of those earnings to us in the form of dividends, loans or advances and through repayment of loans or advances from us. Payments to us by our subsidiaries and joint ventures will be contingent upon our subsidiaries' or joint ventures' earnings and other business considerations and may be subject to statutory or contractual restrictions. We have not paid regular dividends on our common stock; however, we paid a special cash dividend in December 2020 and in August 2021 that was financed with the cash proceeds from our sale of our Performance Materials and Performance Chemicals businesses, respectively. To the extent that we determine in the future to pay dividends on our common stock, the

agreements governing our outstanding indebtedness significantly restrict the ability of our subsidiaries to pay dividends or otherwise transfer assets to us.

We may need to recognize impairment charges related to goodwill, identified intangible assets, fixed assets and investments in affiliated companies.

We are required to test goodwill and any other intangible asset with an indefinite life for possible impairment on the same date each year and on an interim basis if there are indicators of a possible impairment. We are also required to evaluate indefinite-lived intangible assets, fixed assets and investments in affiliated companies for impairment if there are indicators of a possible impairment.

There is significant judgment required in the analysis of a potential impairment of goodwill, identified intangible assets, fixed assets, and investments in affiliated companies. If, as a result of a general economic slowdown or deterioration in one or more of the industries in which we operate or in our financial performance or future outlook, or if the estimated fair value of our long-lived assets decreases, we may determine that one or more of our long-lived assets is impaired. An impairment charge would be determined based on the estimated fair value of the assets and any such impairment charge could have a material adverse effect on our results of operations and financial position.

We performed our annual impairment test on goodwill on October 1, 2024, and determined there was no goodwill impairment at the reporting unit level. During the year ended December 31, 2024, we recognized an other-than-temporary impairment charge of $65 million on our investment in the Zeolyst Joint Venture to reduce the carrying value of our investment to its estimated fair value.

We may be subject to future changes in tax legislation or exposure to additional tax liabilities that may adversely affect our results of operations.

We are subject to taxes in the U.S. as well as foreign jurisdictions where our subsidiaries are organized. Due to economic and political conditions, tax rates, tax laws and other non-tax legislation, such as economic substance regulations, our business may experience significant impacts as a result of prospective changes. For example, the Inflation Reduction Act (“IRA”) enacted in the U.S. on August 16, 2022 imposes several new taxes that became effective in 2023, including a 1% excise tax on stock repurchases. Our future effective tax rates may be affected by changes in the mix of earnings in countries with differing statutory tax rates, changes in the valuation of deferred tax assets and liabilities, changes in available tax credits or tax deductions, as well as changes in tax and other non-tax laws or their interpretation. Additionally, our organization is engaged in a number of cross-border intercompany transactions, subject to local transfer pricing regimes currently in place. We believe the economics of these transactions have been clearly reported, and the appropriate local transfer pricing documentation is contemporaneously available, although tax authorities may propose and potentially sustain adjustments that could result in changes to our mix of earnings in countries with differing statutory tax rates. The Organization of Economic Cooperation and Development (“OECD”), which represents a coalition of member countries, is supporting changes to numerous long-standing tax principles through its base erosion and profit shifting (“BEPS”) project. This project focuses on a number of issues, including the shifting of profits cross-border amongst affiliated entities. Given the scope of the Company's international operations and the fluid and uncertain nature of how the BEPS project might ultimately lead to future legislation, it is difficult to assess how any changes in tax laws would impact the Company's future income tax expense. For example, the Model Rules under BEPS’s Pillar Two include a common approach for a global minimum tax. The Company has assessed that the minimum tax was not within the scope of the Model Rules beginning January 1, 2024. The Company will continue to monitor the BEPS project and the applicability of new tax legislation to the Company and will update accordingly when the Company becomes subject to the minimum tax.

Our tax returns and other tax matters are subject to examination by local tax authorities and governmental bodies. We regularly assess the likelihood of an adverse outcome resulting from these examinations, in order to determine any resulting impact to our provision for taxes. There can be no assurance as to the outcome of these examinations. If our effective tax rates were to increase as a result of a tax examination, or if the ultimate determination of the taxes owed by us is for an amount in excess of amounts previously accrued, our operating results, cash flows and financial condition could be adversely affected.

We have underfunded pension plan liabilities. We will require current and future operating cash flow to fund these shortfalls. We have no assurance that we will generate sufficient cash flow to satisfy these obligations.

We maintain defined benefit pension plans covering employees who meet age and service requirements. While all of our plans have been frozen, our net pension liability and cost is materially affected by the discount rate used to measure pension obligations, the longevity and actuarial profile of our workforce, the level of plan assets available to fund those obligations and the actual and expected long-term rate of return on plan assets. Significant changes in investment performance or a change in the portfolio mix of invested assets can result in corresponding increases and decreases in the valuation of plan assets, particularly equity securities, or in a change in the expected rate of return on plan assets. Assets available to fund the pension obligations of our plans as of December 31, 2024 were approximately $59.7 million, or approximately $2.0 million less than the measured pension benefit obligation on a GAAP basis. In addition, any changes in the discount rate could result in a significant increase or decrease in the valuation of pension obligations, affecting the reported funded status of our pension plans as well as the net periodic pension cost in the following years. Similarly, changes in the expected return on plan assets can result in significant changes in the net periodic pension cost in the following years.

We also provide certain health care and life insurance benefits through an unfunded plan to a group of retirees in the United States who retired prior to the date on which these benefit programs were frozen. Current employees are not eligible for any post-retirement health care or life insurance benefits. Costs of these other post-employment benefit plans are dependent upon numerous factors, assumptions and estimates.

Risks Related to our Indebtedness

Our substantial level of indebtedness could adversely affect our financial condition.

We have substantial indebtedness, which as of December 31, 2024, totaled approximately $870.8 million. Our substantial indebtedness, combined with our other financial obligations and contractual commitments, could have important consequences, including:

- requiring us to dedicate a substantial portion of our cash flows from operations to payments on our indebtedness, thereby reducing funds available for working capital, capital expenditures, acquisitions, selling and marketing efforts, product development and other purposes;
- increasing our vulnerability to adverse economic and industry conditions, which could place us at a competitive disadvantage compared to our competitors that have relatively less indebtedness;
- limiting our flexibility in planning for, or reacting to, changes in our business and the industries in which we operate;
- increasing our exposure to rising interest rates because certain of our borrowings are at variable interest rates;
- restricting us from making investments, strategic acquisitions or causing us to make non-strategic divestitures; and
- limiting our ability to borrow additional funds, or to dispose of assets to raise funds, if needed, for working capital, capital expenditures, acquisitions, product development and other corporate purposes.

Although the terms of the agreements governing our outstanding indebtedness contain restrictions on the incurrence of additional indebtedness, such restrictions are subject to a number of important exceptions and indebtedness incurred in compliance with such restrictions could be substantial. If we and our restricted subsidiaries incur significant additional indebtedness, the related risks that we face could increase.

The terms of our indebtedness restrict our current and future operations, particularly our ability to respond to change or to take certain actions.

The agreements governing our outstanding indebtedness contain a number of restrictive covenants that impose significant operating and financial restrictions on us and may limit our ability to engage in acts that may be in our long-term best interest, including restrictions on our ability to incur additional indebtedness, make investments, acquisitions, loans and advances, sell, transfer or otherwise dispose of our assets or incur liens. See "Management's Discussion and Analysis of Financial Condition and Results of Operations—Financial Condition, Liquidity and Capital Resources—Debt." In addition, the restrictive covenants in the agreements governing our senior secured credit facilities require us to maintain specified financial ratios and satisfy other financial condition tests. Our ability to meet these financial ratios and tests can be affected by events beyond our control.

A breach of such covenants could result in an event of default unless we obtain a waiver to avoid such default. If we are unable to obtain a waiver, such a default may allow our creditors to accelerate the related debt and may result in the acceleration of, or default under, any other debt to which a cross-acceleration or cross-default provision applies. In the event our lenders or noteholders accelerate the repayment of our borrowings, we and our subsidiaries may not have sufficient assets to repay that indebtedness.

Risks Related to our Common Stock

Our stock price could be extremely volatile and, as a result, you may not be able to resell your shares at or above the price you paid for them.

Since launching our initial public offering ("IPO") in September 2017, the price of our common stock, as reported on the New York Stock Exchange, has ranged from a low of $6.02 on August 5, 2024 to a high of $18.90 on March 9, 2021. In addition, the stock market in general has been highly volatile. As a result, the market price of our common stock is likely to be similarly volatile, and investors in our common stock may experience a decrease, which could be substantial, in the value of their stock, including decreases unrelated to our operating performance or prospects, and could lose part or all of their investment. The price of our common stock could be subject to wide fluctuations in response to a number of factors, including those described elsewhere herein and others such as:

- variations in our operating performance and the performance of our competitors;
- actual or anticipated fluctuations in our quarterly or annual operating results;
- publication of research reports by securities analysts about us, our competitors or our industry;
- our failure or the failure of our competitors to meet analysts' projections or guidance that we or our competitors may give to the market;
- additions or departures of key personnel;
- strategic decisions by us or our competitors, such as acquisitions, divestitures, spin-offs, joint ventures, strategic investments or changes in business strategy;
- the passage of legislation or other regulatory developments affecting us or our industry;
- changes in legislation, regulation and government policy as a result of the U.S. presidential and congressional elections;
- speculation in the press or investment community;
- changes in accounting principles;
- sales of substantial amounts of our stock by current stockholders (including stock by insiders or 5% stockholders);
- terrorist acts, acts of war or periods of widespread civil unrest;
- natural disasters and other calamities; and
- changes in general market and economic conditions.

In addition, broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance, and factors beyond our control may cause our stock price to decline rapidly and unexpectedly. We are exposed to the impact of any global or domestic economic disruption that may occur.

In the past, securities class action litigation has often been initiated against companies following periods of volatility in their stock price. This type of litigation could result in substantial costs and divert our management's attention and resources, and could also require us to make substantial payments to satisfy judgments or to settle litigation.

Your percentage ownership in us may be diluted by future issuances of capital stock, which could reduce your influence over matters on which stockholders vote.

Our board of directors has the authority, without action or vote of our stockholders, to issue all or any part of our authorized but unissued shares of common stock, including shares issuable upon exercise of options, or shares of our authorized but unissued preferred stock. Issuances of common stock or voting preferred stock would reduce your influence over matters on which our stockholders vote and, in the case of issuances of preferred stock, would likely result in your interest in us being subject to the prior rights of holders of that preferred stock.

Provisions in our charter documents and Delaware law may deter takeover efforts that may be beneficial to stockholder value.

Provisions in our certificate of incorporation and bylaws and Delaware law could make it harder for a third party to acquire us, even if doing so might be beneficial to our stockholders. These provisions include a classified board of directors and the ability of our board of directors to issue preferred stock without stockholder approval that could be used to dilute a potential hostile acquirer. Our certificate of incorporation imposes some restrictions on mergers and other business combinations between us and any holder of 15% or more of our outstanding common stock other than INEOS Limited and investment funds affiliated with CCMP, Capital Advisors, L.P. ("CCMP"), one of our former stockholders. As a result, you may lose your ability to sell your stock for a price in excess of the prevailing market price due to these protective measures, and efforts by stockholders to change the direction or management of the Company may be unsuccessful.

Our certificate of incorporation designates courts in the State of Delaware as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our certificate of incorporation provides that, subject to limited exceptions, the Court of Chancery of the State of Delaware is the sole and exclusive forum for:

- any derivative action or proceeding brought on our behalf;
- any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders;
- any action asserting a claim against us arising pursuant to any provision of the General Corporation Law of the State of Delaware, our certificate of incorporation or our bylaws;
- any action to interpret, apply, enforce or determine the validity of our certificate of incorporation or bylaws; or
- any other action asserting a claim against us that is governed by the internal affairs doctrine (each, a "Covered Proceeding").

In addition, our certificate of incorporation provides that if any action the subject matter of which is a Covered Proceeding is filed in a court other than the specified Delaware courts without the approval of our board of directors (each, a "Foreign Action"), the claiming party will be deemed to have consented to (i) the personal jurisdiction of the specified Delaware courts in connection with any action brought in any such courts to enforce the exclusive forum provision described above and (ii) having service of process made upon such claiming party in any such enforcement action by service upon such claiming party's counsel in the Foreign Action as agent for such claiming party.

Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to these provisions. These provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and employees. Alternatively, if a court were to find these provisions of our certificate of incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business and financial condition.

We may not pay additional dividends on our common stock and, consequentially, you may not receive any return on investment unless you sell your common stock for a price greater than that which you paid for it.

We have not paid special cash dividends since December 2020 and August 2021, and our board of directors may decide to retain future earnings, if any, for future operations, expansion and debt repayment and may not pay any special or regular dividends for the foreseeable future. Any decision to declare and pay special or regular dividends in the future will be made at the discretion of our board of directors and will depend on, among other things, our results of operations, financial condition, cash requirements, contractual restrictions and other factors that our board of directors may deem relevant. In addition, our ability to pay dividends may be limited by covenants of any existing and future outstanding indebtedness we or our subsidiaries incur, including our credit facilities and outstanding notes. See "Because our operations are conducted through our subsidiaries and joint ventures, we are dependent on the receipt of distributions and dividends or other payments from our subsidiaries and joint ventures for cash to fund our operations and expenses, including to make future dividend payments, if any." As a result, you may not receive any return on an investment in our common stock unless you sell your common stock for a price greater than that which you paid for it.

General Risk Factors

Significant trade developments stemming from the U.S. administration and other countries could have an adverse effect on us.

Tariffs and other trade barriers imposed by the United States or other countries have affected and could continue to adversely affect our manufacturing costs, our ability to source and import raw materials and equipment on a cost-effective basis, our ability to export our products, and our ability to compete successfully against other companies that are not impacted by tariffs to the same extent as the Company. Our financial results are affected by our ability to sell our products globally. Additionally, the uncertainties created by tariffs and other trade barriers could negatively continue to affect our customers' demand for our products. It is difficult to predict the effects of current or future tariffs and other trade barriers and disputes, and the Company's efforts to reduce the effects of tariffs through pricing and other measures may not be effective.

The United States has in recent years renegotiated a number of trade agreements, such as the United States-Mexico-Canada Agreement ("USMCA"), imposed tariffs on goods imported from China and certain other countries, and increasingly levied sanctions and export controls on China, Russia and other countries. It is currently unclear what additional actions, if any, will be taken by the United States and other countries with respect to the imposition of tariffs on goods imported into the United States. During his campaign and during the first weeks of his administration, President Trump expressed various intentions to impose tariffs on goods shipped from China, Canada, Mexico or other countries to the United States, including up to 60% tariffs on goods shipped from China. We are continuing to evaluate the impact of these announced and other proposed tariffs. Implementation of tariffs by the United States, or the imposition of retaliatory tariffs and other restrictions by other countries, could result in a material increase in the cost of our products, which may result in our products becoming less attractive relative to products offered by our competitors. These changes, as well as any other changes in social, political, regulatory and economic conditions, or further changes to foreign or domestic laws and policies governing foreign trade (including export, import and sanctions), manufacturing and development and foreign direct investment in the territories and countries where we or our customers operate could adversely affect our operating results and our business.

If we lose certain key personnel or are unable to hire additional qualified personnel, we may not be able to execute our business strategy and our business could be adversely affected.

Our success depends, in part, upon the continued services of our highly skilled personnel involved in management, research, production and distribution and, in particular, upon the efforts and abilities of our key officers. Although we believe that we are adequately staffed in key positions, we may not be able to retain such personnel on acceptable terms or at all, and such personnel may seek to compete with us in the future. If we lose the service of any of our key personnel, we may not be able to hire replacements with the same level of industry experience and knowledge necessary to execute our business strategy, which in turn could have a material adverse effect on our business, financial condition, results of operations or cash flows.

We depend on good relations with our workforce, and any significant disruptions could adversely affect our operations.

As of December 31, 2024, we had 920 employees worldwide, approximately 45% of which were represented by a union, works council or other employee representative body. As of December 31, 2024, none of our U.S. unionized employees were covered under collective bargaining agreements that will expire on or before December 31, 2025. Failure to reach agreement with any of our unionized work groups regarding the terms of their collective bargaining agreements or annual pay increases may result in a labor strike, work stoppage or slowdown. For example, unionized employees at our Ecoservices' Houston facility went on strike for 21 days in 2024 before agreeing to a new collective bargaining agreement. In addition, a large number of our employees are employed in countries in which employment laws provide greater bargaining or other rights to employees than the laws of the United States. Such employment rights require us to work collaboratively with the legal representatives of the employees to effect any changes to labor arrangements. For example, many of our employees in Europe are represented by works councils that must approve any changes in conditions of employment, including salaries, benefits and staff changes, and may impede efforts to restructure our workforce. Although we believe that we have a good working relationship with our employees, a strike, work stoppage or slowdown by our employees or a dispute with our employees could result in a significant disruption to our operations or higher ongoing labor costs. In addition, our ability to make adjustments to control compensation and benefit costs, or otherwise adapt to changing business needs, may be limited by the terms and duration of our collective bargaining agreements.

We are subject to certain risks related to litigation filed by or against us, as well as administrative and regulatory proceedings, and adverse results may harm our business.

We cannot predict with certainty the cost of defense, the cost of prosecution or the ultimate outcome of litigation and other administrative and regulatory proceedings filed by or against us, including remedies or damage awards, and how adverse results in any litigation or other administrative and regulatory proceedings may materially harm our business. Litigation and other administrative and regulatory proceedings may include, but are not limited to, actions relating to intellectual property, commercial arrangements, environmental, health and safety matters, joint venture agreements, labor and employment matters, domestic and foreign antitrust matters or other harms resulting from the actions of individuals or entities outside of our control. In the case of intellectual property litigation and proceedings, adverse outcomes could include the cancellation, invalidation or other loss of material intellectual property rights used in our business and injunctions prohibiting our use of our processes, apparatuses, technology, trade secrets and proprietary manufacturing expertise, methods and compounds that are subject to third-party patents or other third-party intellectual property rights. Litigation based on environmental matters or exposure to hazardous substances in the workplace or from our products could result in significant liability for us. For example, we are currently subject to various asbestos premises liability claims that relate to a contractor exposure to asbestos contained in certain building materials at our sites. Furthermore, our international operations expose us to potential administrative and regulatory proceedings in foreign jurisdictions. Adverse outcomes in any of the foregoing could have a material adverse effect on our business.

We determined that a material weakness in our internal control over financial reporting existed as of December 31, 2024. If we fail to properly remediate this or any future material weakness or deficiencies and fail to maintain effective internal control over financial reporting and effective disclosure controls and procedures in the future, our ability to produce accurate and timely financial statements may be impaired and we may not be able to accurately report our financial results in a timely manner or prevent fraud, which may adversely affect investor confidence in our company.

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, as amended, our management is required to report on, and our independent registered public accounting firm is required to attest to, the effectiveness of our internal control over financial reporting. This assessment includes disclosure of any material weakness identified by our management in our internal control over financial reporting. In addition, we are required to comply with the SEC's rules implementing Section 302 of the Sarbanes-Oxley Act, which requires management to certify financial and other information in our quarterly and annual reports, and we are required to disclose significant changes made in our internal controls and procedures on a quarterly basis.

We have identified a material weakness in our internal control over financial reporting associated with the accounting of our investment in the Zeolyst Joint Venture and have concluded that our internal control over financial reporting and our disclosure controls and procedures related to our investment in the Zeolyst Joint Venture were not effective as of December 31, 2024. A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented or detected on a timely basis.

As described in Item 9A - Controls and Procedures elsewhere in this Annual Report on Form 10-K, management concluded that the Company does not have sufficient controls designed to ensure the earnings from the Zeolyst Joint Venture, an equity method investee underlying the Company's financial statements, were completely, accurately, and timely recorded. This material weakness could result in a misstatement of our Investments in affiliated companies and Equity in net income from affiliated companies that would not be prevented or detected on a timely basis. We may not be able to remediate this material weakness in a timely manner and even if we remediate this material weakness, we may have other material weaknesses or deficiencies in our internal control over financial reporting in the future. If we are unable to assert that our internal control over financial reporting is effective, or if our independent registered public accounting firm is unable to express an unqualified opinion as to the effectiveness of our internal control over financial reporting in future periods, investors may lose confidence in the accuracy and completeness of our financial reports, the market price of our common stock could be negatively affected, and we could become subject to investigations by the New York Stock Exchange, on which our securities are listed, the SEC or other regulatory authorities, which could require additional financial and management resources.

Regulations related to conflict minerals could adversely impact our business.

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 contains provisions to improve transparency and accountability concerning the supply of certain minerals, known as conflict minerals, originating from the Democratic Republic of Congo (the "DRC") and adjoining countries. The SEC requires annual disclosure and reporting requirements for those companies who use conflict minerals mined from the DRC and adjoining countries in their products. We incur costs associated with complying with these disclosure requirements, including for diligence to determine the sources of conflict minerals used in our products and other potential changes to products, processes or sources of supply as a consequence of such verification activities. These rules could adversely affect the sourcing, supply and pricing of materials used in our products. As there may be only a limited number of suppliers offering "conflict free" conflict minerals, we may not be able to obtain necessary conflict minerals from such suppliers in sufficient quantities or at competitive prices.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 1C. CYBERSECURITY.

Risk Management and Strategy

The Company has adopted processes designed to identify, assess and manage material risks from cybersecurity threats, which are integrated into the Company's overall risk management systems and processes. Those processes include response to and an assessment of internal and external threats to the security, confidentiality, integrity and availability of our data and information systems, along with other material risks to our operations. The Company references the National Institute of Standards and Technology Cybersecurity Framework to help identify, assess and manage cybersecurity risks and has adopted and tested a formal cybersecurity incident response plan. As part of our risk management process, the Company also engages third-party providers to conduct periodic internal and external penetration testing and maturity assessments. The Company stores data on premise and in cloud environments, with security appropriate to the data involved and has adopted controls around, among other things, access and acceptable use, backup and recovery and vendor risk assessment.

Our cybersecurity program is managed by the Cyber Incident Response Team (the "CIRT"), which is led by the Global IT Director, System Infrastructure Manager and the Network Infrastructure Manager, each with over 20 years of experience in IT. The CIRT serves as the core team responsible for managing the enterprise-wide cybersecurity policy, maintenance and compliance across all platforms. The CIRT is responsible for the detection and initial assessment of potential cybersecurity threats and incidents. The CIRT classifies detected cyber incidents to allow prioritization, response and escalation. Incidents are documented for internal reporting processes and regularly shared with senior management.

In the event of a potential cybersecurity incident, the CIRT will conduct an assessment to determine the nature and scope of the incident and manages the incident in accordance with our incident response plan until the incident is contained and resolved. The CIRT will document findings and make them available to the Disclosure Committee, which includes cross functional senior management representation from information technology, legal, finance, investor relations and business segments. The Disclosure Committee, in conjunction with third-party experts, including outside legal counsel, is responsible for assessing the materiality of any cybersecurity incident and coordinating external communications and disclosures, including with the Securities and Exchange Commission.

On a quarterly basis, our employees, contractors and other users of the Company's systems and networks are required to take cybersecurity training. The training is designed to provide employees and contractors with a baseline understanding of cybersecurity fundamentals to prevent security breaches and safely identify potential threats. These trainings are administered through a collaboration with third-party services and systems and address various topics, including how to handle sensitive and personal information, physical security of intellectual property, how to identify phishing attempts, reducing our risk to being phished and how to improve cybersecurity intelligence while working from home.

As of December 31, 2024, we are not aware of any cybersecurity threats that have materially affected or are reasonably likely to materially affect the Company's business strategy, results of operations, or financial condition, although we may be materially affected in the future by such risks or future material incidents. See "Risk Factors—Risks Related to Our Business Operations—Disruption, failure or cyber security breaches affecting or targeting computers and infrastructure used by us or our business partners may adversely impact our business and operations" for additional information regarding cybersecurity risks.

Governance: Roles and Responsibilities

Cybersecurity is an important part of our risk management processes and an area of focus for Ecovyst's management and Board of Directors. We continue to invest in cybersecurity and the resiliency of our networks and to enhance our internal controls and processes, which are designed to help protect our systems and infrastructure and the information they contain.

Our Board is actively involved in the assessment, oversight and management of the material risks that could affect the Company. The Board carries out its risk oversight and management responsibilities by monitoring risk directly as a full Board and, where appropriate, through its committees. The Board has delegated to the Audit Committee the responsibility to oversee the integrity of the Company's information technology and cybersecurity risks and to assess the risks and incidents relating to cybersecurity threats. While our Board and Audit Committee oversee cybersecurity risk, management, through the CIRT, is responsible for the implementation and management of cybersecurity risk

management systems and processes and for the communication of incidents to senior management and the Audit Committee.

The CIRT meets with the CEO and other members of our senior management on a quarterly basis and meets with the Audit Committee at least annually. Additionally, the Audit Committee regularly meets with members of the Company's internal audit function to discuss risk management activities, compliance, best practices, and other related matters.

ITEM 2. PROPERTIES.

Our operating headquarters is currently located in Malvern, Pennsylvania and our primary research and development facility is in Conshohocken, Pennsylvania. As of December 31, 2024, we had ten manufacturing facilities in two countries. We also had five administrative facilities and two research and development facilities located in two countries. Our joint ventures operated out of two facilities located in two countries.

The table below presents summary information regarding our principal manufacturing facilities that we own as of December 31, 2024.

Location	Segment
Baton Rouge, Louisiana, United States	Ecoservices
Baytown, Texas, United States	Ecoservices
Dominguez, California, United States	Ecoservices
Delfzijl, The Netherlands[1]	Advanced Materials & Catalysts
Hammond, Indiana, United States	Ecoservices
Houston, Texas, United States	Ecoservices
Kansas City, Kansas, United States[1]	Advanced Materials & Catalysts
Martinez, California, United States	Ecoservices
West Orange, Texas, United States	Ecoservices
Portland, Oregon, United States	Ecoservices

(1) We lease a portion of the site to the Zeolyst Joint Venture.

ITEM 3. LEGAL PROCEEDINGS.

From time to time we may be subject to various legal claims and proceedings incidental to the normal conduct of business, relating to such matters as personal injury, product liability and warranty claims, waste disposal practices, release of chemicals into the environment and other matters that may arise in the ordinary course of our business. We currently believe that there is no litigation pending that is likely to have a material adverse effect on our business. Regardless of the outcome, legal proceedings can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

ITEM 4. MINE SAFETY DISCLOSURES.

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES.

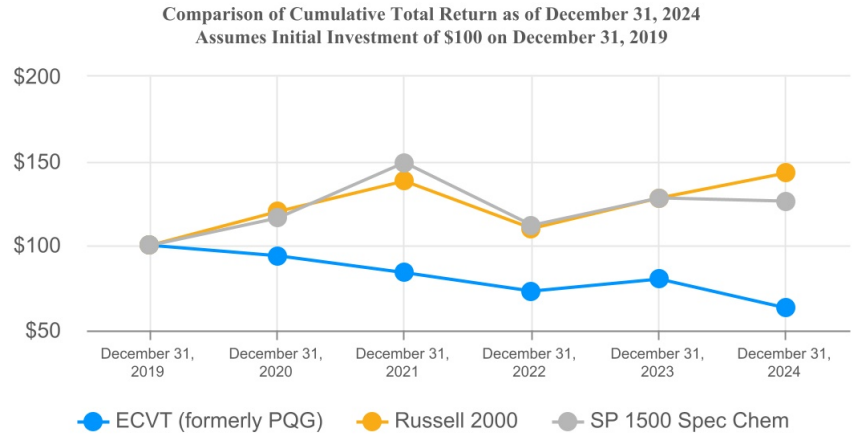
Market Information, Holders and Dividends

Our common stock trades on the New York Stock Exchange ("NYSE") under the symbol "ECVT". As of February 21, 2025, there were 10 shareholders of record of our common stock. A substantially greater number of holders of our common stock hold their shares in "street name" through banks, brokers and other financial institutions.

We have not and do not currently intend to pay regular dividends on our common stock in the foreseeable future. The declaration and payment of any future dividends by our Board of Directors is subject to compliance with the covenants contained in the agreements governing our credit facilities, applicable law and other considerations. See Note 16 to our consolidated financial statements included in this Form 10-K for information regarding covenant restrictions on the payment of dividends under our debt agreements.

Stock Performance Graph

The graph below shows the cumulative total shareholder return of our common stock for the period from December 31, 2019 to December 31, 2024 as compared to the cumulative total return of the Russell 2000 Total Return Index and the S&P 1500 Specialty Chemicals Index, assuming an investment of $100 made at the respective closing prices on December 31, 2019. The information contained in the graph below is furnished and therefore not to be considered "filed" with the SEC, and is not incorporated by reference into any document that incorporates this Form 10-K by reference.



	12/31/2019	12/31/2020	12/31/2021	12/31/2022	12/31/2023	12/31/2024
ECVT (formerly PQG)	$ 100	$ 94	$ 84	$ 73	$ 80	$ 63
Russell 2000	100	120	138	110	128	143
SP 1500 Spec Chem	100	116	149	112	128	126

Issuer Purchases of Equity Securities

2022 Stock Repurchase Program

In April 2022, our Board of Directors approved a stock repurchase program that authorized the Company to purchase up to $450 million of the Company's common stock over the four-year period from the date of approval. This program is expected to be funded using cash on hand and cash generated from operations. We primarily expect to conduct the repurchase program through negotiated transactions with the Company's equity sponsors, as well as through open market repurchases or other means, including through Rule 10b-18 trading plans or through the use of other techniques such as accelerated share repurchases. The actual timing, number and nature of shares repurchased will depend on a variety of factors, including stock, price, trading volume, and general business and market conditions. The repurchase program does not obligate us to acquire any number of shares in any specific period or at all and may be amended, suspended or discontinued at any time at our discretion.

On August 16, 2022, the Inflation Reduction Act of 2022, or IRA, was signed into law. Among other things, the IRA imposes a 15% corporate alternative minimum tax for certain large corporations with average annual adjusted financial statement income in excess of $1 billion for tax years beginning after December 31, 2022, levies a 1% excise tax on net stock repurchases after December 31, 2022, and provides tax incentives to promote clean energy. Historically the Company has made discretionary share repurchases under its share repurchase programs.

During the three months ended December 31, 2024, the Company did not repurchase shares of its common stock on the open market pursuant to the stock repurchase program and therefore did not need to accrue excise tax related to repurchases. As of December 31, 2024, $229.6 million was available for additional share repurchases under the program.

Tax Withholdings

In connection with the vesting of restricted stock awards, restricted stock units and performance stock units, shares of common stock may be delivered to the Company by employees to satisfy withholding tax obligations at the instruction of the employee award holders. These transactions when they occur, are accounted for as stock repurchases by the Company, with the shares returned to treasury stock at a cost representing the payment by the Company of the tax obligations on behalf of the employees in lieu of shares for the vesting unit. There were no such transactions during the three months ended December 31, 2024.

ITEM 6. [Reserved]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

Overview

We are a leading integrated and innovative global provider of advanced materials, specialty catalysts and services. We believe that our products and services contribute to improving the sustainability of the environment.

We conduct operations through two reporting segments: (1) Ecoservices and (2) Advanced Materials & Catalysts (including our 50% interest in the Zeolyst Joint Venture).

Ecoservices: We are a leading provider of sulfuric acid recycling to the North American refining industry for the production of alkylate, an essential gasoline component for lowering vapor pressure and increasing octane to meet stringent gasoline specifications and fuel efficiency standards. We are also a leading North American producer of high quality and high strength virgin sulfuric acid for industrial and mining applications. We also provide chemical waste handling and treatment services, as well as ex-situ catalyst activation services for the refining and petrochemical industry.

Advanced Materials & Catalysts: We are a global supplier of finished silica catalyst, catalyst supports and functionalized silicas necessary to produce high performing plastics and to enable sustainable chemistry through our Advanced Silicas business. This segment also includes our 50% interest in the Zeolyst Joint Venture, where we are a leading global supplier of specialty zeolites used in catalysts that supports the production of sustainable fuels, remove nitrogen oxides from diesel engine emissions and that are broadly applied in refining and petrochemical processes.

Effective November 28, 2023, the Company renamed the Catalyst Technologies segment to Advanced Materials & Catalysts. Beginning with the year ended December 31, 2023, the segment results and disclosures included in the Company's consolidated financial statements reflect the new segment name for all periods presented. This change to the Company's segment name does not change the Company's consolidated balance sheets, statements of income or cash flows for the prior periods or the way the Company's chief operating decision maker ("CODM," or the Company's Chief Executive Officer) evaluated the business.

In 2024, we served global customers across many end uses and, as of December 31, 2024, operated out of ten strategically located owned manufacturing facilities.

Effective on August 1, 2021, we completed the sale of our Performance Chemicals business to Sparta Aggregator L.P., a partnership with Koch Minerals & Trading, LLC and Cerberus Capital Management, L.P. The results of operations, financial condition, and cash flows for the Performance Chemicals business are presented herein as discontinued operations for the 2022 period presented. Refer to Note 4 of our consolidated financial statements for additional information.

Economic Effects on our Business and Results

We continue to monitor the developments in Russia and Ukraine, as well as the related economic sanctions and export controls imposed on certain industry sectors. Although the current conflict has created global economic and political uncertainties and affected certain supply chain disruptions, we do not believe we have significant exposure in those countries. We have no operations in Russia or Ukraine. We had no sales to customers or purchases from suppliers in Ukraine and Russia for the years ended December 31, 2024 and 2023. Our sales to a customer in Russia were immaterial and we did not make any purchases from suppliers for the year ended December 31, 2022. As Russia's invasion of Ukraine continues to unfold, we will continue to monitor compliance with sanctions imposed by the U.S. government and other countries.

We also continue to monitor the developments in the Middle East. Although the Company experienced shipment delays during the year, the impact remained immaterial to our business.

Stock Repurchase Program

On April 27, 2022, the Board approved a stock repurchase program that authorized the Company to purchase up to $450.0 million of the Company's common stock over the four-year period from the date of approval. For the year ended December 31, 2024, the Company repurchased 552,081 shares on the open market at an average price of $9.05 per share, for a total of $5.0 million excluding brokerage commissions and accrued excise tax. As of December 31, 2024, $229.6 million was available for share repurchases under the program.

During the year ended December 31, 2023, the Company repurchased 541,494 shares on the open market at an average price of $9.85 per share, for a total of $5.3 million, excluding brokerage commissions and accrued excise tax. Additionally, in connection with secondary offerings of the Company's common stock by an equity sponsor in March and May 2023, the Company repurchased 7,000,000 shares of its common stock in the offerings from underwriters at a weighted average price of $10.48 per share concurrently with the close of the offerings, for a total of $73.4 million, excluding accrued excise tax.

Basis of Presentation

Our zeolite catalysts product group operates through the Zeolyst Joint Venture, which we account for as an equity method investment in accordance with accounting principles generally accepted in the United States ("GAAP"). We do not record sales by the Zeolyst Joint Venture as revenue and such sales are not consolidated within our results of operations. However, net income and Adjusted EBITDA for the Company's Advanced Materials & Catalysts segment reflects our 50% portion of the earnings from the Zeolyst Joint Venture that have been recorded as equity in net income in our consolidated statements of income and includes Zeolyst Joint Venture adjustments on a proportionate basis based on our 50% ownership interest.

Key Performance Indicators

Adjusted EBITDA and Adjusted Net Income

Adjusted EBITDA and Adjusted Net Income are financial measures that are not prepared in accordance with GAAP and that we use to evaluate our operating performance, for business planning purposes and to measure our performance relative to that of our competitors. Adjusted EBITDA and Adjusted Net Income are presented as key performance indicators as we believe these financial measures will enhance a prospective investor's understanding of our results of operations and financial condition. EBITDA consists of net (loss) income attributable to continuing operations before interest, taxes, depreciation and amortization. Adjusted EBITDA consists of EBITDA adjusted for (i) non-operating income or expense, (ii) the impact of certain non-cash, nonrecurring or other items included in net (loss) income and EBITDA that we do not consider indicative of our ongoing operating performance, and (iii) depreciation, amortization and interest of our 50% share of the Zeolyst Joint Venture. Adjusted Net Income consists of net (loss) income adjusted for (i) non-operating income or expense and (ii) the impact of certain non-cash, nonrecurring or other items included in net (loss) income that we do not consider indicative of our ongoing operating performance. We believe that these non-GAAP financial measures provide investors with useful financial metrics to assess our operating performance from period-to-period by excluding certain items that we believe are not representative of our core business.

You should not consider Adjusted EBITDA or Adjusted Net Income in isolation or as alternatives to the presentation of our financial results in accordance with GAAP. The presentation of Adjusted EBITDA and Adjusted Net Income financial measures may differ from similar measures reported by other companies and may not be comparable to other similarly titled measures. In evaluating Adjusted EBITDA and Adjusted Net Income, you should be aware that we are likely to incur expenses similar to those eliminated in this presentation in the future and that certain of these items could be considered recurring in nature. Our presentation of Adjusted EBITDA and Adjusted Net Income should not be construed as an inference that our future results will be unaffected by unusual or nonrecurring items. Reconciliations of Adjusted EBITDA and Adjusted Net Income to GAAP net (loss) income are included in the results of operations discussion that follows for each of the respective periods.

Key Factors and Trends Affecting Operating Results and Financial Condition

Sales

Overall, our Ecoservices and Advanced Materials & Catalysts segments continued to benefit from positive demand trends for our products and services in the majority of end uses we serve. For Ecoservices, strong domestic and export demand for refined products continued to support high refinery utilization rates, while more stringent gasoline standards and growing demand for premium gasoline to power higher-compression and turbo-charged engines continued to drive demand for alkylate and for our regeneration services. In addition, demand for virgin sulfuric acid across a wide range of industrial applications remained favorable. For our Advanced Materials & Catalysts segment, global polyethylene demand remained positive, supporting our sales of polyethylene catalysts and catalysts supports.

Cost of Goods Sold

Cost of goods sold consists of variable product costs, fixed manufacturing expenses, depreciation expense and freight expenses. Variable product costs include all raw materials, energy and packaging costs that are directly related to the manufacturing process. Fixed manufacturing expenses include all plant employment costs, manufacturing overhead and periodic maintenance costs.

The primary raw materials for our Ecoservices segment include spent sulfuric acid, sulfur, acids, bases (including sodium hydroxide, or "caustic soda") and certain metals. Spent sulfuric acid for our Ecoservices segment is supplied by customers as part of their contracts. The primary raw materials used in the manufacture of products in our Advanced Materials & Catalysts segment include sodium silicate and cesium hydroxide.

Most of our Ecoservices contracts feature take-or-pay volume protection and/or quarterly price adjustments for commodity inputs, labor, the Chemical Engineering Index (U.S. chemical plant construction cost index) and natural gas. About 90% of our Ecoservices segment sales for the year ended December 31, 2024 were under contracts featuring quarterly price adjustments. The price adjustments generally reflect actual costs for producing acid and tend to protect us from volatility in labor, fixed costs and raw material pricing. The take-or-pay volume protection allows us to cover fixed costs through intermittent, temporary production issues at customer refineries.

While natural gas is not a direct feedstock for any product, natural gas powered machinery and equipment are used to heat raw materials and create the chemical reactions necessary to produce end-products. We maintain multiple suppliers wherever possible and structure our customer contracts when possible to allow for the pass-through of raw material, labor and natural gas costs.

Joint Venture

We account for our investments in our equity joint ventures under the equity method. Our joint venture, the Zeolyst Joint Venture, manufactures high-performance, specialty, zeolite-based catalysts, used in emission control, refining and petrochemical industry applications and by the broader chemicals industry. Demand for the Zeolyst Joint Venture products fluctuates based upon the timing of our customer's fixed bed catalyst replacements. We share proportionally in the management of our joint venture with the other parties to such joint venture.

Seasonality

Our regeneration services product group, which is a part of our Ecoservices segment, typically experiences seasonal fluctuations as a result of higher demand for gasoline products in the summer months and lower demand in the winter months. These demand fluctuations generally result in higher sales and working capital requirements in the second and third quarters.

Foreign Currency

As a global business, we are subject to the impact of gains and losses on currency translations, which occur when the financial statements of foreign operations are translated into U.S. dollars. We operate in various geographies with approximately 5% and 6% of our sales for the years ended December 31, 2024 and 2023, respectively are in currencies other than the U.S. dollar. Because our consolidated financial results are reported in U.S. dollars, sales or earnings generated in currencies other than the U.S. dollar can result in a significant increase or decrease in the amount of those sales and earnings when translated to U.S. dollars. The foreign currency to which we have the most significant exchange rate exposure is the British pound.

Results of Operations

Year Ended December 31, 2024 Compared to the Year Ended December 31, 2023

Highlights

The following is a summary of our financial performance for the year ended December 31, 2024 compared with the year ended December 31, 2023.

Sales

Sales increased $13.4 million to $704.5 million. The increase in sales was primarily due to higher sales volume of regeneration services and virgin sulfuric acid, partially offset by lower average selling prices as a result of the pass-through of costs in Ecoservices.

Gross Profit

Gross profit increased $3.6 million to $201.5 million. The increase in gross profit was primarily due to higher sales volume and favorable variable costs, partially offset by lower average selling prices and unfavorable manufacturing costs.

Operating Income

Operating income increased $1.3 million to $98.0 million. The increase in operating income was primarily due to the increase in gross profit.

Equity in Net Income of Affiliated Companies

Equity in net income of affiliated companies decreased $15.5 million to $15.1 million. The decrease was primarily due to lower earnings from the Zeolyst Joint Venture, driven by lower sales volume.

Impairment of Investment in Affiliated Companies

During the year ended December 31, 2024, we recognized an impairment charge of $65 million on our investment in the Zeolyst Joint Venture to reduce the carrying value of our investment to its estimated fair value.

The following is our consolidated statement of income and a summary of financial results for the years ended December 31, 2024 and 2023.

	Years ended December 31,		Change	
	2024	2023	$	%
	(in millions, except percentages)			
Sales	$ 704.5	$ 691.1	$ 13.4	1.9 %
Cost of goods sold	503.0	493.2	9.8	2.0 %
Gross profit	201.5	197.9	3.6	1.8 %
Gross profit margin	*28.6 %*	*28.6 %*		
Selling, general and administrative expenses	83.9	79.2	4.7	5.9 %
Other operating expense, net	19.6	22.0	(2.4)	(10.9)%
Operating income	98.0	96.7	1.3	1.3 %
Operating income margin	*13.9 %*	*14.0 %*		
Equity in net (income) from affiliated companies	(15.1)	(30.6)	15.5	(50.7)%
Impairment of investment in affiliated companies	65.0	—	65.0	NM
Interest expense, net	49.4	44.7	4.7	10.5 %
Debt extinguishment costs	4.6	—	4.6	NM
Other (income) expense, net	(0.8)	0.6	(1.4)	(233.3)%
(Loss) income before income taxes	(5.1)	82.0	(87.1)	(106.2)%
Provision for income taxes	1.6	10.8	(9.2)	(85.2)%
Effective tax rate	*(32.5)%*	*13.2 %*		
Net (loss) income	$ (6.7)	$ 71.2	$ (77.9)	(109.4)%

Sales

	Years ended December 31,		Change	
	2024	2023	$	%
	(in millions, except percentages)			
Sales:				
Ecoservices	$ 598.3	$ 584.8	$ 13.5	2.3 %
Advanced Materials & Catalysts	106.2	106.3	(0.1)	(0.1) %
Total sales	$ 704.5	$ 691.1	$ 13.4	1.9 %

Ecoservices: Sales in Ecoservices for the year ended December 31, 2024 were $598.3 million, an increase of $13.5 million, or 2.3%, compared with sales of $584.8 million for the year ended December 31, 2023. The increase in sales reflects higher sales volume of $42.4 million, partially offset by lower average selling pricing of 28.9 million, inclusive of the negative impact associated with the pass-through of lower sulfur costs of approximately $7 million.

Sales volume increased driven by higher virgin sulfuric acid and regeneration services sales for the year ended December 31, 2024 as compared to the year ended December 31, 2023, which had the adverse impact of Winter Storm Elliott and extended maintenance turnaround activity at our facilities in 2023, as well as strong demand for regeneration services in the gulf coast in 2024. Average selling prices were lower primarily due to the pass-through of lower costs, including sulfur, natural gas, freight and other variable costs, partially offset by favorable contract-pricing for regeneration services.

Advanced Materials & Catalysts: Sales in Advanced Materials & Catalysts for the year ended December 31, 2024 were $106.2 million, a decrease of $0.1 million, compared with sales of $106.3 million for the year ended December 31, 2023. The change in sales was primarily due to lower sales volume and mix of $0.4 million, partially offset by higher average selling prices of $0.3 million.

The change in volume reflects higher sales for finished polyethylene catalysts and niche custom catalysts, offset by lower sales of polyethylene catalyst supports during the year ended December 31, 2024.

Gross Profit

Gross profit for the year ended December 31, 2024 was $201.5 million, an increase of $3.6 million, or 1.8%, compared with $197.9 million for the year ended December 31, 2023. The increase in gross profit is primarily driven by higher sales volume and mix of $22.8 million, unfavorable manufacturing costs of $2.4 million and lower average selling prices of $21.6 million, exclusive of the pass-through of sulfur costs.

The increase in sales volume was primarily related to higher demand for regeneration services and virgin sulfuric acid. Higher manufacturing costs was primarily driven by general inflation, higher planned maintenance costs and costs associated with our manufacturing plant reliability improvement program in Ecoservices. Average selling prices were lower primarily due to the pass-through of lower costs, including sulfur, natural gas, freight and other variable costs.

Selling, General and Administrative Expenses

Selling, general and administrative expenses for the year ended December 31, 2024 were $83.9 million, an increase of $4.7 million compared with $79.2 million for the year ended December 31, 2023. The increase in selling, general and administrative expenses was primarily due to an increase in other compensation-related expenses of $12.4 million, partially offset by decreases in stock compensation of $2.0 million, professional fees of $2.1 million and other expenses of $3.8 million.

Other Operating Expense, Net

Other operating expense, net for the year ended December 31, 2024 was $19.6 million, a decrease of $2.4 million compared with $22.0 million for the year ended December 31, 2023. The decrease in other operating expense, net was mainly driven by smaller losses on asset disposals during the year ended December 31, 2024 and residual costs from the sale of the Performance Chemicals business and other transactions costs that occurred during the year ended December 31, 2023. The Company recorded an impairment on an intangible asset of $3.9 million during the year ended December 31, 2024.

Equity in Net Income of Affiliated Companies

Equity in net income of affiliated companies for the year ended December 31, 2024 was $15.1 million, a decrease of $15.5 million as compared with $30.6 million for the year ended December 31, 2023. The decrease was primarily due to lower sales for hydrocracking and emission control catalysts and lower sales of catalysts used in the production of sustainable fuels within the Zeolyst Joint Venture during the year ended December 31, 2024 as compared to the year ended December 31, 2023.

Impairment of Investment in Affiliated Companies

During the year ended December 31, 2024, we recognized an impairment charge of $65 million on our investment in the Zeolyst Joint Venture to reduce the carrying value of our investment to its estimated fair value, which declined primarily due to the demand outlook for catalyst materials used in emission control applications and the production of sustainable fuels. In May 2016, as a result of a business combination, the investment in the Zeolyst Joint Venture was increased through purchase accounting fair value adjustments. This impairment was a partial reduction to the goodwill and trade name components of the purchase accounting fair value adjustments recorded as a result of the 2016 business combination.

Interest Expense, Net

Interest expense, net for the year ended December 31, 2024 was $49.4 million, an increase of $4.7 million, as compared with $44.7 million for the year ended December 31, 2023. The increase in interest expense, net was primarily due to year over year increase in variable rates and the decrease in the benefits associated with our interest rate caps, partially offset by lower outstanding debt for the year ended December 31, 2024, as compared to the year ended December 31, 2023 and the reductions in our spread associated with the June 2024 refinancing.

Debt Extinguishment Costs

Debt extinguishment costs for the year ended December 31, 2024 were $4.6 million. On June 12, 2024, the Company amended its existing senior secured term loan facility to reduce the applicable interest rates and extend the maturity of the facility to June 2031. The Company evaluated the terms of the amendment in accordance with *ASC 470-50 Debt - Modification and Extinguishment* and determined that the amendment was primarily a modification of debt. As a result, we recorded $4.5 million of third-party financing fees as debt extinguishment costs in the consolidated statements of income during the year ended December 31, 2024. In addition, previously unamortized deferred financing costs and original issue discount of $0.1 million associated with the existing senior secured term loan facility were written off as debt extinguishment costs for the year ended December 31, 2024.

In January 2025, the Company re-priced the 2024 Term Loan Facility to reduce the applicable interest rate. The terms of the facility were substantially consistent following the re-pricing, except that borrowings under the facility will bear interest at a rate equal to term SOFR plus 2.00% per annum.

Other (Income) Expense, Net

Other (income) expense, net for the year ended December 31, 2024 was income of $0.8 million, a change of $1.4 million, compared with expense of $0.6 million for the year ended December 31, 2023. The change primarily related to the sale of environmental credits during the year ended December 31, 2024.

Provision for Income Taxes

The provision for income taxes for the year ended December 31, 2024 was $1.6 million compared with $10.8 million for the year ended December 31, 2023. The effective income tax rate for the year ended December 31, 2024 was (32.5)% compared to 13.2% for the year ended December 31, 2023. The difference between the U.S. federal statutory income tax rate and our effective income tax rate for the year ended December 31, 2024 was mainly due to the impact of the tax deductibility of the impairment of investment in affiliated companies, the statute of limitations expiration related to prior year uncertain tax positions, foreign tax credit benefit and research and development tax credit benefit. The difference between the U.S. federal statutory income tax rate and our effective income tax rate for the year ended December 31, 2023 was mainly due the impact of a valuation allowance release connected to our state investment tax credit carryovers, foreign tax credit benefit, the Section 162(m) deduction limitation for "covered" employees with compensation in excess of $1 million, along with the tax deductibility of stock compensation.

Net Loss (Income)

For the foregoing reasons, net loss was $6.7 million for the year ended December 31, 2024 as compared to net income of $71.2 million for the year ended December 31, 2023.

Adjusted EBITDA

Summarized EBITDA and Adjusted EBITDA information is shown below in the following table:

	Years ended December 31,		Change	
	2024	2023	$	%
	(in millions, except percentages)			
Adjusted EBITDA[1]:				
Ecoservices	$ 200.3	$ 200.0	$ 0.3	0.2 %
Advanced Materials & Catalysts[2]	64.7	81.9	(17.2)	(21.0)%
Unallocated corporate expenses	(26.8)	(22.0)	(4.8)	21.8 %
Total	$ 238.2	$ 259.9	$ (21.7)	(8.3)%

(1) We define Adjusted EBITDA as EBITDA adjusted for certain items as noted in the reconciliation below. Our management evaluates the performance of our segments and allocates resources based primarily on Adjusted EBITDA. Adjusted EBITDA does not represent cash flow for periods presented and should not be considered as an alternative to net income as an indicator of our operating performance or as an alternative to cash flows as a source of liquidity. Adjusted EBITDA may not be comparable with EBITDA or Adjusted EBITDA as defined by other companies.

(2) The Adjusted EBITDA from the Zeolyst Joint Venture included in the Advanced Materials & Catalysts segment was $32.2 million for the year ended December 31, 2024, which includes $15.1 million of equity in net income, excluding $3.8 million of amortization of investment in affiliate step-up plus $13.3 million of joint venture depreciation, amortization and interest.

The Adjusted EBITDA from the Zeolyst Joint Venture included in the Advanced Materials & Catalysts segment was $50.5 million for the year ended December 31, 2023, which includes $30.6 million of equity in net income, excluding $6.4 million of amortization of investment in affiliate step-up plus $13.4 million of joint venture depreciation, amortization and interest.

Ecoservices: Adjusted EBITDA for the year ended December 31, 2024 was $200.3 million, an increase of $0.3 million, or 0.2%, compared to $200.0 million for the year ended December 31, 2023. The change in Adjusted EBITDA was a result of higher sales volumes and favorable contract pricing, largely offset by higher transportation costs and planned maintenance costs inclusive of turnarounds, as well as unfavorable net pricing, reflecting the timing and contractual pass-through of certain costs, including energy and other indexed costs.

Advanced Materials & Catalysts: Adjusted EBITDA for the year ended December 31, 2024 was $64.7 million, a decrease of $17.2 million, or 21.0%, compared with $81.9 million for the year ended December 31, 2023. Adjusted EBITDA decreased primarily due to lower sales volume within the Zeolyst Joint Venture.

A reconciliation of net (loss) income to Adjusted EBITDA is as follows:

	Years ended December 31,	
	2024	2023
	(in millions)	
Reconciliation of net (loss) income to Adjusted EBITDA		
Net (loss) income	$ (6.7)	$ 71.2
Provision for income taxes	1.6	10.8
Interest expense, net	49.4	44.7
Depreciation and amortization	89.4	84.6
EBITDA	133.7	211.3
Joint venture depreciation, amortization and interest[(a)]	13.3	13.4
Amortization of investment in affiliate step-up[(b)]	3.8	6.4
Impairment of investment in affiliated companies[(c)]	65.0	—
Intangible asset impairment charge	3.9	—
Debt extinguishment costs	4.6	—
Net loss on asset disposals[(d)]	2.4	4.1
Foreign currency exchange gain[(e)]	(0.2)	(1.3)
LIFO (benefit) expense[(f)]	(2.2)	3.5
Transaction and other related costs[(g)]	0.4	3.0
Equity-based compensation	14.0	16.0
Restructuring, integration and business optimization expenses[(h)]	1.0	2.7
Other[(i)]	(1.5)	0.8
Adjusted EBITDA	$ 238.2	$ 259.9

(a) We use Adjusted EBITDA as a performance measure to evaluate our financial results. Because our Advanced Materials & Catalysts segment reflects our 50% portion of the earnings from the Zeolyst Joint Venture, we include an adjustment for our 50% proportionate share of depreciation, amortization and interest expense of the Zeolyst Joint Venture.

(b) Represents the amortization of the fair value adjustments associated with the equity affiliate investment in the Zeolyst Joint Venture as a result of the combination of the businesses of PQ Holdings Inc. and Eco Services Operations LLC in May 2016. We determined the fair value of the equity affiliate investment and the fair value step-up was then attributed to the underlying assets of the Zeolyst Joint Venture. Amortization is primarily related to the fair value adjustments associated with intangible assets, including customer relationships and technical know-how.

(c) Represents fair value impairments associated with the equity affiliate investment in the Zeolyst Joint Venture. During the year ended December 31, 2024, we recognized an impairment charge on our investment in the Zeolyst Joint Venture to reduce the carrying value of our investment to its estimated fair value. This impairment was an adjustment to the goodwill component of the purchase accounting fair value adjustments recorded as a result of the combination of the businesses of PQ Holdings Inc. and Eco Services Operations LLC in May 2016.

(d) When asset disposals occur, we remove the impact of net gain/loss of the disposed asset because such impact primarily reflects the non-cash write-off of long-lived assets no longer in use.

(e) Reflects the exclusion of the foreign currency transaction gains and losses in the statements of income related to the remeasurement effects of monetary assets and liabilities, including non-permanent intercompany debt, denominated in foreign currency.

(f) Represents non-cash adjustments to the Company's LIFO reserves for certain inventories in the U.S. that are valued using the LIFO method, effectively reflecting the results as if these inventories were valued using the FIFO method, which we believe provides a means of comparison to other companies that may not use the same basis of accounting for inventories.

(g) Relates to certain transaction costs, including debt financing, due diligence and other costs related to transactions that are completed, pending or abandoned, that we believe are not representative of our ongoing business operations.

(h) Includes the impact of restructuring, integration and business optimization expenses, which are incremental costs that are not representative of our ongoing business operations.

(i) Other consists of adjustments for items that are not core to our ongoing business operations. These adjustments include environmental remediation and other legal costs, expenses for capital and franchise taxes, and defined benefit pension and postretirement plan (benefits) costs, for which our obligations are under plans that are frozen. Also included in this amount are adjustments to eliminate the benefit realized in cost of goods sold of the allocation of a portion of the contract manufacturing payments under the five-year agreement with the buyer of the Performance Chemicals business to the financing obligation under the failed sale-leaseback. Included in this line-item are rounding discrepancies that may arise from rounding from dollars (in thousands) to dollars (in millions).

Adjusted Net Income

Summarized Adjusted Net Income information is shown below in the following table:

	Years ended December 31,					
	2024			2023		
	Pre-tax	Tax expense (benefit)	After-tax	Pre-tax	Tax expense (benefit)	After-tax
	(in millions)					
Reconciliation of net (loss) income to Adjusted Net Income [1][2]						
Net (loss) income	$ (5.1)	$ 1.6	$ (6.7)	$ 82.0	$ 10.8	$ 71.2
Amortization of investment in affiliate step-up[b]	3.8	1.0	2.8	6.4	1.6	4.8
Impairment of investment in affiliated companies[c]	65.0	0.5	64.5	—	—	—
Intangible asset impairment charge	3.9	1.0	2.9	—	—	—
Debt extinguishment costs	4.6	1.2	3.4	—	—	—
Net loss on asset disposals[d]	2.4	0.6	1.8	4.1	1.0	3.1
Foreign currency exchange gain[e]	(0.2)	(0.1)	(0.1)	(1.3)	(0.3)	(1.0)
LIFO (benefit) expense[f]	(2.2)	(0.6)	(1.6)	3.5	0.9	2.6
Transaction and other related costs[g]	0.4	0.1	0.3	3.0	0.8	2.2
Equity-based compensation	14.0	3.0	11.0	16.0	1.5	14.5
Restructuring, integration and business optimization expenses[h]	1.0	0.3	0.7	2.7	0.7	2.0
Other[i]	(1.5)	(0.5)	(1.0)	0.8	0.2	0.6
Adjusted Net Income, including impact of valuation allowance release and changes in uncertain tax positions release	86.1	8.1	78.0	117.2	17.2	100.0
Impact of valuation allowance release[3]	—	—	—	—	10.2	(10.2)
Changes in uncertain tax positions release[4]	—	9.4	(9.4)	—	—	—
Adjusted Net Income	$ 86.1	$ 17.5	$ 68.6	$ 117.2	$ 27.4	$ 89.8

(1) We define Adjusted Net Income as net (loss) income adjusted for non-operating income or expense and the impact of certain non-cash or other items that are included in net (loss) income that we do not consider indicative of our ongoing operating performance. Adjusted Net Income is presented as a key performance indicator as we believe it will enhance a prospective investor's understanding of our results of operations and financial condition. Adjusted Net Income may not be comparable with net (loss) income or Adjusted Net Income as defined by other companies.

(2) Refer to the Adjusted EBITDA notes above for more information with respect to each adjustment.

(3) Represents the tax impact of the state tax credit valuation allowance release. Item is not expected to be recurring.

(4) Represents the tax impact of previously net unrecognized tax benefits, excluding interest and penalties, primarily due to the expiration of statutes of limitations.

The adjustments to net income are shown net of applicable tax rates of 25.3% and 25.4% for the years ended December 31, 2024 and 2023, respectively, except for equity-based compensation and the impairment of investment in affiliated companies. The tax effect on equity-based compensation is derived by removing the tax effect of any equity-based compensation expense disallowed as a result of its inclusion within IRC Sec. 162(m) and adding the tax effect of equity-based compensation shortfall recorded as a discrete item. The tax effect on the impairment of investment in affiliated companies is derived by removing the tax impact of the non-deductible component specific to goodwill.

Results of Operations

Year Ended December 31, 2023 *Compared to the Year Ended* December 31, 2022

A discussion of our performance for the year ended December 31, 2023 compared to the year ended December 31, 2022 is set forth in Part II, Item 7 of our Form 10-K for the year ended December 31, 2023 under the caption "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Financial Condition, Liquidity and Capital Resources

Our primary sources of liquidity consist of cash flows from operations, existing cash balances as well as funds available under our asset based lending revolving credit facility ("ABL Facility"). We expect that ongoing requirements for debt service and capital expenditures will be funded from these sources of funds. Our primary liquidity requirements include funding working capital requirements (primarily inventory and accounts receivable, net of accounts payable and other accrued liabilities), debt service requirements and capital expenditures. Our capital expenditures include both maintenance of business, which include spending on maintenance and health, safety and environmental initiatives as well as growth, which includes spending to drive organic sales growth and cost savings initiatives.

We believe that our existing cash and cash equivalents and cash flows from operations, combined with availability under our ABL Facility, will be sufficient to meet our presently anticipated future cash needs for at least the next twelve months. We may also pursue strategic acquisition or divestiture opportunities, which may impact our future cash requirements. We may, from time to time, increase borrowings under our ABL Facility to meet our future cash needs. As of December 31, 2024, we had cash and cash equivalents of $146.0 million and availability of $75.2 million under our ABL Facility, after giving effect to $3.3 million of outstanding letters of credit, for a total available liquidity of $221.2 million. We did not have any revolving credit facility borrowings as of December 31, 2024. As of December 31, 2024, we were in compliance with all covenants under our debt agreements.

Our ABL Facility has one financial covenant with two ratios to maintain. The first ratio compares the total ABL availability against a threshold: the greater of 10% of the line cap (which is defined as the lesser of our revolving loan commitments and the value of our assets) or $20.0 million. The greater of this threshold cannot be greater than the total availability of the ABL Facility. The second ratio compares the ABL Facility availability of the U.S. revolving credit facility against a $15.0 million threshold. As of December 31, 2024, we were in compliance with the financial covenant under the ABL Facility.

The 2024 Term Loan Facility and the ABL Facility contain various restrictive covenants. Each limits the ability of the Company and its restricted subsidiaries to incur certain indebtedness or liens, merge, consolidate or liquidate, dispose of certain property, make investments or declare or pay dividends, make optional payments, modify certain debt instruments, enter into certain transactions with affiliates, enter into certain sales and leasebacks and certain other non-financial restrictive covenants. During such time, the Company is required to maintain a fixed-charge coverage ratio of at least 1.0 to 1.0. The Company was compliant with all debt covenants under the 2024 Term Loan Facility and the ABL Facility as of December 31, 2024 and 2023, respectively.

Included in our cash and cash equivalents balance as of December 31, 2024 was $9.6 million of cash and cash equivalents in foreign jurisdictions. Depending on foreign cash balances, we have certain flexibility to repatriate funds should the need arise. Should the need arise, we would repatriate the funds in the most tax efficient manner from those subsidiaries. Repatriation of foreign cash is generally not subject to U.S. federal income taxes at the time of cash distribution. However, foreign earnings may still be taxed for state income tax purposes, as well as subject to certain foreign withholding tax obligations, when cash amounts are distributed back to the U.S.

Over the course of the next twelve months and beyond, we anticipate making significant cash payments for known contractual and other obligations, including:

Principal and interest on long-term debt

As of December 31, 2024, our total indebtedness was $870.8 million, with up to $75.2 million of available borrowings under our ABL. Our liquidity requirements are significant, primarily due to debt service requirements. As reported, our cash interest expense for the years ended December 31, 2024, 2023 and 2022 was approximately $49.0 million, $42.1 million and $35.4 million, respectively. Before any impact of hedges, a one percent change in assumed interest rates for our variable interest credit facilities would have an annual impact of approximately $8.7 million on interest expense. The principal balance due in the next twelve months is $8.7 million.

Interest payments due within the next twelve months are $50.1 million using the interest rate effective as of December 31, 2024 on our variable interest credit facilities. Interest on long-term debt excludes amortization of deferred financing fees and original issue discount. The actual interest payments may differ materially based on actual amounts of long-term debt outstanding and actual interest rates in future periods, as well as the hedging impact from our interest rate cap agreements.

Subject to approval by our board of directors, we may raise additional capital or borrowings from time to time or seek to refinance our existing debt. There can be no assurances that future capital or borrowings will be available to us, and the cost and availability of new capital or borrowings could be materially impacted by market conditions. Further, the decision to refinance our existing debt is based on a number of factors, including general market conditions and our ability to refinance on attractive terms at any given point in time. Any attempts to raise additional capital or borrowings or refinance our existing debt could cause us to incur significant charges. Such charges could have a material impact on our financial position, results of operations, or cash flows.

Lease obligations

The Company has operating and finance lease agreements for land, buildings, railcars, vehicles, manufacturing equipment and general office equipment, as well as a financing obligation in connection with a failed-sale-leaseback. We utilize an incremental borrowing rate over the relevant operating and finance lease terms, which is the rate of interest that it would have to pay to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment. We utilize a fixed borrowing rate for the financing obligation.

As of December 31, 2024, our total operating lease liabilities was $33.5 million, with $11.0 million of principal and interest payments made during the year. Operating lease payments due within the next twelve months is $11.0 million.

As of December 31, 2024, our total finance lease liabilities was $0.02 million and due within in the next twelve months. Principal and interest payments made during the year was $0.1 million.

As of December 31, 2024, our total finance obligation was $4.9 million, with $3.1 million of principal and interest payments made during the year. Finance obligation due within the next twelve months is $3.1 million.

Cash Flow

	Years ended December 31,		
	2024	2023	2022
		(in millions)	
Continuing Operations			
Net cash provided by (used in)			
Operating activities	$ 149.9	$ 137.6	$ 180.4
Investing activities	(73.5)	(65.3)	(63.0)
Financing activities	(17.9)	(93.5)	(148.1)
Discontinued Operations			
Net cash provided by			
Operating activities	—	—	6.3
Effect of exchange rate changes on cash and cash equivalents	(0.9)	(1.3)	(5.5)
Net change in cash and cash equivalents	57.6	(22.5)	(29.9)
Cash and cash equivalents at beginning of period	88.4	110.9	140.9
Cash and cash equivalents at end of period	$ 146.0	$ 88.4	$ 111.0

The following discussions related to our cash flows are presented on a continuing operations basis, which excludes the cash flows from our former Performance Chemicals business, which was accounted for as discontinued operations.

Year Ended December 31, 2024 compared to the Year Ended December 31, 2023

Net cash provided by operating activities was $149.9 million for the year ended December 31, 2024, compared with $137.6 million provided for the year ended December 31, 2023. Cash generated by operating activities, other than changes in working capital was higher by $12.3 million during the year ended December 31, 2024, as compared to the prior year which was primarily driven by higher dividends received from affiliates, offset by lower earnings, higher cash taxes and cash interest paid. The decrease in cash from working capital during the year ended December 31, 2024 of $0.1 million was unfavorable compared to the year ended December 31, 2023 primarily due to unfavorable changes in inventories and accrued liabilities, which were partially offset by favorable changes in receivables, prepaids and other current assets.

The unfavorable change in inventories was primarily due to the timing of sales orders and inventory build. The unfavorable change in accrued liabilities primarily relates to timing of payments for variable employee compensation liabilities. The favorable change in receivables was driven by the timing of collection of sales. The favorable change in prepaids and other current assets primarily relates to the timing of interest and other receivables.

Net cash used in investing activities was $73.5 million for the year ended December 31, 2024, compared to net cash used of $65.3 million during the year ended December 31, 2023. Cash used in investing activities consisted of $69.0 million and $65.3 million to fund capital expenditures during the years ended December 31, 2024 and 2023, respectively. The Company paid $4.5 million to complete a minority equity investment in Pajarito Powder LLC during the year ended December 31, 2024.

Net cash used in financing activities was $17.9 million for the year ended December 31, 2024, compared with $93.5 million used during the year ended December 31, 2023. Net cash used in financing activities was driven by the lower repurchases of the Company's common stock of $73.7 million during the year ended December 31, 2024 compared to December 31, 2023.

Year Ended December 31, 2023 *compared to the Year Ended* December 31, 2022

A discussion of our cash flows for the year ended December 31, 2023 compared to the year ended December 31, 2022 is set forth in Part II, Item 7 of our Form 10-K for the year ended December 31, 2023 under the caption "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Debt

	December 31,	
	2024	2023
	(in millions)	
2024 Term Loan Facility	$ 870.8	$ 877.5
ABL Facility	—	—
Total debt	870.8	877.5
Original issue discount	(7.2)	(6.2)
Deferred financing costs	(2.8)	(3.4)
Total debt, net of original issue discount and deferred financing costs	860.8	867.9
Less: current portion	(8.7)	(9.0)
Total long-term debt, excluding current portion	$ 852.1	$ 858.9

As of December 31, 2024 our total debt was $870.8 million excluding the original issue discount of $7.2 million and deferred financing fees of $2.8 million for our senior secured credit facilities. Our net debt was $724.8 million, including cash and cash equivalents of $146.0 million. Our total available liquidity as of December 31, 2024 was $221.2 million, which represents our cash on hand of $146.0 million plus our excess availability under our ABL of $75.2 million, after giving effect to $3.3 million of outstanding letters of credit and no revolving credit facility borrowings. We

may seek, subject to market conditions and other factors, opportunities to repurchase, refinance or otherwise reprice our debt.

2024 Term Loan Facility

On June 9, 2021, we entered into an agreement for a senior secured term loan facility (the "2021 Term Loan Facility") in an aggregate principal amount of $900.0 million, with an original issue discount of 0.25% and interest at a floating rate of LIBOR (with a 0.50% minimum LIBOR floor) plus 2.75% per annum (or, depending on the Borrower's first lien net leverage ratio, 2.50%), with a maturity date of June 9, 2028. The 2021 Term Loan Facility required scheduled quarterly amortization payments, each equal to 0.25% of the original principal amount of the loans under the 2021 Term Loan Facility. The proceeds from the 2021 Term Loan Facility were used to repay the senior secured term loan facility we entered into an agreement in 2020 in full and partially repay the senior secured term loan facility we entered into an agreement in 2018.

On February 9, 2023, we amended the 2021 Term Loan Facility to replace LIBOR with a Secured Overnight Financing Rate ("SOFR") as the benchmark interest rate. Following this amendment, the 2021 Term Loan Facility bears interest at an adjusted SOFR rate (with a 0.50% minimum floor) plus 2.75% per annum (or, depending on the first lien net leverage ratio, 2.50%).

On June 12, 2024, we amended the 2021 Term Loan Facility, to among other things, (a) reduce the interest rate applicable to all outstanding SOFR term loans to term SOFR plus 2.25% per annum from a maximum of adjusted term SOFR plus 2.75% per annum, (b) reduce the interest rate applicable to all outstanding base rate term loans to the alternate base rate plus 1.25% per annum from a maximum of the alternate base rate plus 1.75% per annum and (c) extend the maturity date of all outstanding term loans to June 12, 2031 (the amended term loans, the "2024 Term Loan Facility"). As a result of the amendment, there is no longer a credit spread adjustment of 10 basis points.

On January 30, 2025, the Company amended the 2024 Term Loan Facility to, among other things, (a) reduce the interest rate applicable to all outstanding SOFR term loans to term SOFR plus 2.00% per annum from a maximum of term SOFR plus 2.25% per annum and (b) reduce the interest rate applicable to all outstanding base rate term loans to the alternate base rate plus 1.00% per annum from a maximum of the alternate base rate plus 1.25% per annum.

ABL Facility

On May 4, 2016, we entered a $200.0 million senior secured ABL facility, which provided for $200.0 million in revolving credit commitments.

On March 20, 2020, we amended the ABL Facility to increase the aggregate amount of the revolving loan commitments available by $50.0 million to $250.0 million, consisting of up to $195.0 million in U.S. commitments, up to $15.0 million in Canadian commitments and up to $40.0 million in European commitments. The maturity of the facility was extended to March 20, 2025. In addition, there was an annual commitment fee equal to 0.375%, with a step-down to 0.25% based on average usage of the revolving credit borrowings available.

Following the amendment, the borrowings under the amended ABL Facility bear interest at a rate equal to the LIBOR rate or the base rate plus a margin of between 1.25% to 1.75% or 0.25% to 0.75%, respectively.

On June 9, 2021, we amended the ABL Facility a third time to decrease the aggregate amount of revolving loan commitments available to $100.0 million, consisting of $90.0 million in U.S. commitments and $10.0 million in European commitments and extended the maturity date to August 2, 2026.

On February 17, 2023, we amended the ABL Facility to replace LIBOR with SOFR as the benchmark interest rate with respect to U.S. dollar-denominated borrowings. Following this amendment, U.S. dollar-denominated borrowings under the ABL Facility bear interest at a rate equal to an adjusted SOFR rate or the base rate plus a margin of between 1.25% and 1.75% or 0.25% to 0.75%, respectively.

As of December 31, 2024, there were no revolving credit borrowings under the ABL Facility. Revolving credit borrowings are payable at our option throughout the term of the ABL Facility with the balance due August 2, 2026. We have the availability to request letters of credit under the ABL Facility. We had $3.3 million of letters of credit outstanding as of December 31, 2024, which reduce available borrowings under the ABL Facility by such amounts.

We were in compliance with all debt covenants as of December 31, 2024 and 2023, respectively.

Capital Expenditures

Maintenance capital expenditures include spending on maintenance of business, health, safety and environmental initiatives. Growth capital expenditures include spending to drive organic sales growth and cost savings initiatives. These capital expenditures represent our "book" capital expenditures for which the Company has recorded, but not necessarily paid for the capital expenditures.

	Years ended December 31,		
	2024	2023	2022
	(in millions)		
Maintenance capital expenditures	$ 53.3	$ 54.1	$ 46.9
Growth capital expenditures	16.1	8.1	9.0
Total capital expenditures	$ 69.4	$ 62.2	$ 55.9

Capital expenditures remained at a level sufficient for required maintenance and certain expansion growth initiatives during these periods. Maintenance capital expenditures were slightly lower in the year ended December 31, 2024 as compared to December 31, 2023 due to extended turnaround activities and additional expenditures incurred related to Winter Storm Elliott impacting our manufacturing facilities in 2023. Growth capital expenditures were higher in the year ended December 31, 2024 as compared to December 31, 2023 primarily due to the planned expansion of the Kansas City Advanced Silicas catalyst coating facility.

Pension Funding

We paid $1.6 million in contributions into our defined benefit pension plans and other postretirement plans in December 31, 2024 and immaterial amounts in December 31, 2023 and 2022. The net periodic pension and postretirement expense (benefit) was $(0.2) million, $0.1 million, and $(1.0) million for those same periods, respectively.

As of December 31, 2024 and 2023, our pension plans and other post-retirement benefit plans were underfunded by $2.5 million and $5.4 million, respectively.

Off-Balance Sheet Arrangements

We had $3.3 million of outstanding letters of credit on our revolver facility as of December 31, 2024 and 2023, respectively.

Critical Accounting Policies and Estimates

We prepare our consolidated financial statements in conformity with GAAP and our significant accounting policies are described in Note 2 to our consolidated financial statements. The preparation of financial statements in conformity with GAAP requires us to make estimates and assumptions that affect reported amounts and related disclosures. We base our estimates and judgments on historical experience and other relevant factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We review these matters and reflect changes in estimates as appropriate. We have identified below the accounting policies, estimates and critical judgment areas that we believe could have a material effect on our financial position, liquidity or results of operations.

Revenue Recognition

In determining the appropriate amount of revenue to be recognized as we fulfill our obligations under our agreements, we perform the following steps: (i) identify the contract with the customer; (ii) determine whether the promised goods or services are performance obligations, including whether they are distinct in the context of the contract; (iii) measure the transaction price; (iv) allocate the transaction price to the performance obligations based on estimated selling prices; and (v) recognize revenue when (or as) we satisfy each performance obligation.

We identify a contract when an agreement with a customer creates legally enforceable rights and obligations, which occurs when a contract has been approved by both parties, the parties are committed to perform their respective obligations, each party's rights and payment terms are clearly identified, commercial substance exists and it is probable that we will collect the consideration to which we are entitled.

Evidence of a contract with a customer may take the form of a master service agreement ("MSA"), a MSA in combination with an underlying purchase order, a combination of a pricing quote with an underlying purchase order or an individual purchase order received from a customer. Certain of our customers enter into MSAs that establish the terms, including prices, under which orders to purchase goods may be placed. In cases where the MSA contains a distinct order for goods or contains an enforceable minimum quantity to be purchased by the customer, we consider the MSA to be evidence of a contract with a customer as the MSA creates enforceable rights and obligations. In cases where the MSA does not contain a distinct order for goods, evidence of a contract with a customer is the purchase order issued under the MSA. Our customers may also negotiate orders via pricing quotes, which typically detail product pricing, delivery terms and payment information. When a customer procures goods under this method, we consider the combination of the pricing quote and the purchase order to create enforceable rights and obligations. Absent either a MSA or pricing quote, we consider an individual purchase order to create enforceable rights and obligations.

We identify a performance obligation in a contract for each promised good that is separately identifiable from other promises in the contract and for which the customer can benefit from the good. The majority of our contracts have a single performance obligation, which is the promise to transfer individual goods to the customer. Certain of our contracts include multiple performance obligations under which the purchase price for each distinct performance obligation is defined in the contract.

As described above, our MSAs with our customers may outline prices for individual products or contract provisions. MSAs in our Ecoservices segment may contain provisions whereby raw materials costs are passed-through to the customer per the terms of their contract. Our exposure to fluctuations in raw materials prices is limited, as the majority of pass-through contract provisions reset based on fluctuations in the underlying raw material price. MSAs in our Ecoservices segment also contain take-or-pay arrangements, whereby the customer would incur a penalty in the form of a shortfall volume fee. Currently there is no history in which customers fail to meet the contractual minimum. Revenue from product sales are recorded at the sales price, which includes estimates of variable consideration for which reserves are established and which result from discounts, returns or other allowances that are offered within contracts with our customers.

We recognize revenues when performance obligations under the terms of a contract with our customer are satisfied, which generally occurs at a point in time by transferring control of a product to the customer. We determine the point in time when a customer obtains control of a product and we satisfy the performance obligation by considering factors including when we have a right to payment for the product, the customer has legal title to the product, we have transferred possession of the product, the customer has assumed the risks and rewards of ownership of the product and the customer has accepted the product. Revenue is measured as the amount of consideration we expect to receive in exchange for transferring goods. We do not have any significant payment terms as payment is received at, or shortly after, the point of sale.

We may recognize revenue from bill-and-hold arrangements initiated by a customer. Under these bill-and-hold arrangements, a customer pays for the goods, but does not take physical possession immediately. We consider satisfaction of performance obligations when we have finished manufacturing the products based on the agreed upon specifications in accordance with the order. These products are custom made to each customer's specifications and cannot be made available for use with another customer's order. Once the goods have been segregated in a designated space in the warehouse and the customer has been invoiced, title to the goods and risk of loss has transferred to the customer. The customers have access to their products to inspect and can take possession prior to the scheduled delivery dates.

Goodwill and Intangible Assets

Assets and liabilities of acquired businesses are measured at their estimated fair values at the dates of acquisition. The excess of the purchase price over the estimated fair value of the net assets acquired, including identified intangibles, is recorded as goodwill. The determination and allocation of fair value to the assets acquired and liabilities assumed is based on various assumptions and valuation methodologies requiring considerable management judgment, including estimates based on historical information, current market data and future expectations.

Goodwill and intangible assets with indefinite lives are not amortized, but are tested for impairment annually or more frequently if events or circumstances exist that would more likely than not reduce the fair value of the reporting unit below its carrying amount.

Goodwill is tested for impairment at the reporting unit level. In performing tests for goodwill impairment, we are able to use our discretion to first perform an optional qualitative assessment about the likelihood of the carrying value of a reporting unit exceeding its fair value. The qualitative assessment need not be applied to all reporting units. If we determine that it is more likely than not that the fair value of a reporting unit is less than its carrying amount based on the qualitative assessment, we perform a quantitative goodwill impairment test to identify the potential goodwill impairment and measure the amount of the goodwill impairment loss, if any, to be recognized for that reporting unit. For the annual assessments in 2024 and 2023, we bypassed the option to perform the qualitative assessment and proceeded directly to performing the quantitative goodwill impairment test for each of our reporting units. The quantitative test identifies both the potential existence of impairment and the amount of impairment loss.

In applying the quantitative test, the Company calculates and compares the reporting unit's estimated fair value to its carrying value, including goodwill. If the fair value of a reporting unit exceeds its carrying value, goodwill is not impaired. If the carrying value of a reporting unit exceeds its fair value, an impairment loss is recognized for the amount by which the carrying value exceeds the reporting unit's fair value. An impairment loss cannot exceed the carrying value of goodwill assigned to a reporting unit and the loss establishes a new basis in the goodwill. Subsequent reversal of an impairment loss is not permitted.

For the purposes of the quantitative goodwill impairment test, we determine the fair value of our reporting units using a combination of a market approach and an income, or discounted cash flow, approach. Estimating the fair value of a reporting unit requires various assumptions including the use of projections of future cash flows and discount rates that reflect the risks associated with achieving those cash flows. The key assumptions used in estimating the fair value are operating margin growth rates, revenue growth rates, the weighted average cost of capital, the perpetual growth rate, and the estimated earnings market multiples of each reporting unit. The market value is estimated using publicly traded comparable company values by applying their most recent annual Adjusted EBITDA multiples to the reporting unit's Adjusted EBITDA for the trailing twelve months. The income approach value is estimated using a discounted cash flow approach. The assumptions about future cash flows and growth rates are based on our assessment of a number of factors including the reporting unit's recent performance against budget as well as management's ability to execute planned future strategic initiatives. Discount rate assumptions are based on an assessment of the risk inherent in those future cash flows.

For intangible assets other than goodwill, definite-lived intangible assets are amortized over their respective estimated useful lives. Intangible assets with indefinite lives are not amortized, but rather are tested for impairment at least annually or more frequently if events occur or circumstances change that would more likely than not reduce the fair value of the intangible asset below its carrying amount. Our indefinite-lived intangible assets include trade names and certain trademarks. Similar to the goodwill impairment test, we may first assess qualitative factors to determine whether it is necessary to perform a quantitative impairment test. If we choose to bypass the qualitative assessment, or if the qualitative assessment indicates that the indefinite-lived intangible asset is more likely than not impaired, a quantitative impairment test must be performed. The quantitative test for indefinite-lived intangible assets is a one-step test comparing the fair value of the asset to its carrying amount. If the fair value of the indefinite-lived intangible asset is less than the carrying amount, an impairment loss is recognized in an amount equal to the difference.

The unit of accounting used to test our indefinite-lived intangible assets for impairment is at the reporting unit level. The fair values of our indefinite-lived trade names and trademarks are determined for impairment testing purposes based on an income approach using a discounted cash flow valuation model under a relief from royalty methodology. Significant assumptions under the relief from royalty method include the royalty rate a market participant may assume, projected sales and the discount rate applied to the estimated cash flows.

For definite-lived intangible assets, we amortize technical know-how over periods that range from fourteen to twenty years, customer relationships over periods that range from seven to fifteen years, trademarks over a fifteen year period, contracts over periods that range from two to sixteen years, and permits over five years. We perform an impairment review of definite-lived intangible assets when facts and circumstances indicate that the carrying value of an asset may not be recoverable from its undiscounted future cash flows. The impairment test for definite-lived intangible assets is consistent with the test applied to property, plant and equipment as described in our policy.

Assessment of the potential impairment of goodwill and intangible assets is an integral part of our normal ongoing review of operations. Testing for potential impairment of these assets is significantly dependent on numerous assumptions and reflects management's best estimates at a particular point in time. Estimates based on these assumptions may differ significantly from actual results. Changes in factors and assumptions used in assessing potential impairments

can have a significant impact on the existence and magnitude of impairments, as well as the time in which such impairments are recognized.

In addition, we continually review our diverse portfolio of assets to ensure they are achieving their greatest potential and are aligned with our growth strategy. Strategic decisions involving a particular group of assets may trigger an assessment of the recoverability of the related assets. Such an assessment could result in impairment losses.

For further information, see Note 14 to these consolidated financial statements.

Investments in Affiliated Companies

Investments in affiliated companies are accounted for using the equity method of accounting if the investment provides the Company with the ability to exercise significant influence, but not control, over the investee. Under the equity method of accounting, the investments in equity-method investees are recorded in the consolidated balance sheets as investments in affiliated companies, and the Company's share of the investees' earnings or losses, together with other than temporary impairments in value, is recorded as equity in net income from affiliated companies in the consolidated statements of income. Any differences between the Company's cost of an equity method investment and the underlying equity in the net assets of the investment, such as fair value step-ups resulting from acquisitions, are accounted for according to their nature and impact the amounts recognized as equity in net income from affiliated companies in the consolidated statements of income.

The Company evaluates its equity method investments for impairment whenever events or changes in circumstances indicate that the carrying amounts of such investments may be impaired. If a decline in the fair value of an equity method investment is determined to be other than temporary, a loss is recorded in earnings in the current period.

For the purposes of the equity method investment impairment test, we determine the fair value of our investment using a combination of a market approach and an income, or discounted cash flow. Estimating the fair value of an equity method investment requires various assumptions including the use of projections of future cash flows and discount rates that reflect the risks associated with achieving those cash flows. The key assumptions used in estimating the fair value are operating margin growth rates, revenue growth rates, selling, general and administrative expenses growth rates, the weighted average cost of capital, the perpetual growth rate, the estimated earnings market multiple, and the estimated control premium. The market value is estimated using publicly traded comparable company values by applying their most recent annual Adjusted EBITDA multiples to the reporting unit's Adjusted EBITDA for the trailing twelve months. The income approach value is estimated using a discounted cash flow approach. The assumptions about future cash flows and growth rates are based on our assessment of a number of factors including the investee's recent performance against budget as well as its ability to execute planned future strategic initiatives. Discount rate assumptions are based on an assessment of the risk inherent in those future cash flows.

Assessment of the potential impairment of investments in affiliate companies is an integral part of our normal ongoing review of operations. Testing for potential impairment of these assets is significantly dependent on numerous assumptions and reflects management's best estimates at a particular point in time. Estimates based on these assumptions may differ significantly from actual results. Changes in factors and assumptions used in assessing potential impairments can have a significant impact on the existence and magnitude of impairments, as well as the time in which such impairments are recognized.

In addition, we continually review our diverse portfolio of assets to ensure they are achieving their greatest potential and are aligned with our growth strategy. Strategic decisions may trigger an assessment of the recoverability of the related assets. Such an assessment could result in impairment losses.

For further information, see Note 10 to these consolidated financial statements.

Income Taxes

We operate within multiple taxing jurisdictions and are subject to tax filing requirements and potential audits within these jurisdictions. Our operations and the global complexity of tax regulations require assessments of uncertainties and judgments in estimating taxes we will ultimately pay. The final taxes paid are dependent upon many factors, including negotiations with taxing authorities in various jurisdictions, outcomes of tax litigation and resolution of disputes arising from federal, state and international tax audits in the normal course of business. The resolution of these uncertainties may result in adjustments to our tax assets and tax liabilities. We use the asset and liability method in accounting for income taxes. Deferred tax assets and liabilities are recorded for temporary differences between the tax basis of assets and liabilities and their reported amounts in the financial statements, using statutory tax rates in effect for

the year in which the differences are expected to reverse. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in the results of operations in the period that includes the enactment date. We evaluate our deferred tax assets each period to ensure that estimated future taxable income will be sufficient in character (e.g., capital gain versus ordinary income treatment), amount and timing, to result in their realizability. A valuation allowance is recorded to reduce the carrying amounts of deferred tax assets, unless it is more likely than not that those assets will be realized. Considerable judgments are required in establishing deferred tax valuation allowances. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences and carryforward deferred tax assets become deductible or utilized. We consider the scheduled reversal of taxable temporary differences, projected future taxable income and tax-planning strategies in making this assessment. As events and circumstances change, valuation allowances are adjusted within results from operations when applicable.

Generally, APB 23 of ASC Topic 740, Income Taxes ("ASC 740"), provides guidance with respect to establishing deferred income taxes on earnings from foreign subsidiaries, to the extent that these earnings are considered to be available for repatriation. Further, ASC 740-30 requires that deferred taxes be established with respect to the earnings of a foreign subsidiary, unless existing tax law provides a means by which the investment in a subsidiary can be recovered tax-free. We have determined that we are able repatriate the non-permanently reinvested earnings of our foreign subsidiaries in a tax-free manner. As such, we are able to assert for purposes of ASC 740-30 that no deferred income taxes are needed with respect to earnings from foreign subsidiaries.

We recognize net tax benefits under the recognition and measurement criteria of ASC 740, which prescribes requirements and other guidance for financial statement recognition and measurement of positions taken or expected to be taken on tax returns. We recognize a financial statement benefit for positions taken for tax return purposes when it will be more likely than not (i.e. greater than 50%) that the positions will be sustained upon tax examination, based solely on the technical merits of the tax positions. Otherwise, no tax benefit is recognized. The tax benefits recognized are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. We recognize potential accrued interest and penalties related to unrecognized tax benefits as a component of income tax expense. Tax examinations are often complex as tax authorities may disagree with the treatment of items reported by us and may require several years to resolve. These accrued liabilities represent a provision for taxes that are reasonably expected to be incurred on the basis of available information but which are not certain.

Stock-Based Compensation

We grant stock-based compensation awards in connection with our stock incentive plans. Under the terms of the incentive plans, we are authorized to issue equity awards to our employees, directors and affiliates. The grants have taken the form of restricted stock awards, restricted stock units, performance stock units and stock options. Restricted stock awards provide the recipient with shares of our stock subject to certain vesting requirements. Restricted stock units and performance stock units provide the recipient with the right to receive shares of our stock at a future date if certain vesting conditions are met. Stock option awards provide the recipient the ability to purchase shares of our stock at a given strike price upon the satisfaction of certain vesting requirements.

The vesting requirements associated with the awards include a mix of both service and/or performance conditions. Depending on the award and recipient, the service condition may reflect a cliff vesting provision (e.g., 100% vested upon four years of service) or a graded vesting provision (e.g., 33.3% vested each year over a period of three years). Prior to the Company's IPO, the Company issued restricted stock awards and stock options with performance conditions that were based on the occurrence of a defined liquidity event upon which certain investment funds affiliated with CCMP receive proceeds exceeding defined thresholds. Although achievement of the performance condition is subject to continued service with us, the terms of awards issued with performance conditions stipulate that the performance vesting condition can be attained for a period of six months following separation from service under certain circumstances, depending on the means of separation from the Company and subject to other factors such as individual separation agreements. The same performance vesting condition for our restricted stock awards also governs the achievement of the performance vesting condition for our stock options. The value of the restricted stock awards granted was based on the average of the high and low trading prices of our common stock on the NYSE on the preceding trading day, in accordance with our policy for valuing such awards.

In addition to restricted stock awards, we have granted restricted stock units and performance stock units as part of our equity incentive compensation program. Each restricted stock unit provides the recipient with the right to receive a share of common stock subject to graded vesting terms based on service, which generally requires one year of service for members of our board of directors and three years of service for employees. Performance stock units vest upon the achievement of Company-specific financial performance targets and the provision of service through the vesting date.

We recognize compensation expense related to our equity awards with service conditions on a straight-line basis over the stated vesting period for each award. Expense related to our equity awards with performance conditions is recognized in the period in which it becomes probable that the performance target will be achieved. No compensation expense has been recognized to-date on any of our restricted stock awards and stock options subject to vesting based on performance conditions, since a liquidity event triggering vesting of the awards has not occurred, nor is it considered probable.

The grant date fair value of restricted stock awards, restricted stock units and performance stock units is based on the value of our common stock as traded on the NYSE. The grant date fair value of stock option awards is estimated using a Black-Scholes option pricing model. Determining the fair value of stock option awards at the grant date requires judgment, including estimates of the average risk-free interest rate, dividend yield, volatility and expected term. Since we have limited experience with respect to historical exercise and forfeiture rates or patterns, we have estimated certain assumptions using acceptable simplified methods and through benchmarking to our peer group of companies.

Recently Issued Accounting Standards

See Note 3 to our consolidated financial statements for a discussion of recently issued accounting standards and their effect on us.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Our major market risk exposure is potential losses arising from changing rates and prices regarding foreign currency exchange rate risk, interest rate risk and credit risk. The Company regularly reviews foreign exchange and interest rate activity, and monitors compliance with our hedging policy. We do not use financial instruments for speculative purposes, and we limit our hedging activity to the underlying economic exposure.

Foreign Exchange Risk

Our financial results are subject to the impact of gains and losses on currency translations, which occur when the financial statements of foreign operations are translated into U.S. dollars. We operate a geographically diverse business with approximately 5% and 6% of our sales during the years ended December 31, 2024 and 2023, respectively, coming from our international operations in currencies other than the U.S. dollar. Because consolidated financial results are reported in U.S. dollars, sales or earnings generated in currencies other than the U.S. dollar can result in a significant increase or decrease in the amount of those sales and earnings when translated to U.S. dollars. The financial statements of our operations outside the United States, where the local currency is considered to be the functional currency, are translated into U.S. dollars using the exchange rate in effect at each balance sheet date for assets and liabilities and the average exchange rate for each period for sales, expenses, gains, losses and cash flows. The exchange rates between these currencies and the U.S. dollar in recent years have fluctuated significantly and may continue to do so in the future. The foreign currency to which we have the most significant exchange rate exposure is the British pound. Sales in this currency represented approximately 5% of our sales during the year ended December 31, 2024. A 10% change in the average British pound to U.S. dollar exchange rate during the year ended December 31, 2024 would have impacted sales by approximately $3.2 million over the same period, or 0.5% of our total sales, assuming product pricing remained constant. The effect of translating foreign subsidiaries' balance sheets into U.S. dollars is included in other comprehensive income. The impact of gains and losses on transactions denominated in currencies other than the functional currency of the relevant operations are included in other expense (income), net in the consolidated statements of income. Income and expense items are translated at average exchange rates during the year. Net foreign currency exchange gains and losses included in other expense (income), net was a $0.3 million loss for the year ended December 31, 2024. The net foreign currency (gain) loss realized in the year ended December 31, 2024 was primarily driven by the remeasurement effects of monetary assets and liabilities, including non-permanent intercompany debt denominated in a foreign currency and translated to U.S. dollars, and was principally non-cash in nature.

Interest Rate Risk

We are exposed to fluctuations in interest rates on our senior secured credit facilities. Changes in interest rates will not affect the market value of such debt but will affect the amount of our interest payments over the term of the loans. Likewise, an increase in interest rates could have a material impact on our cash flow. As of December 31, 2024, a 100 basis point increase in assumed interest rates for our variable interest credit facilities, before impact of any hedges, would have an annual impact of approximately $8.7 million on interest expense.

We hedge the interest rate fluctuations on debt obligations through interest rate cap agreements. We record the fair value of these hedges as assets or liabilities and the related unrealized gains or losses are deferred in stockholders' equity as a component of other comprehensive income (loss), net of tax. The interest rate caps had a fair value net asset of $11.8 million and $16.5 million at December 31, 2024 and 2023, respectively. Fair value is determined based on estimated amounts that would be received or paid to terminate the contracts at the reporting date based on quoted market prices.

For more information about our interest rate cap agreements, refer to Note 18 — Financial Instrument of our consolidated financials statements included in Part II, Item 8 — Financial Statements and Supplementary Data.

Credit Risk

We are exposed to credit risk on financial instruments to the extent our counterparty fails to perform certain duties as required under the provisions of an agreement. We only transact with counterparties having an appropriate credit rating for the risk involved. Credit exposure is managed through credit approval and monitoring procedures.

Concentration of credit risk can result primarily from trade receivables, for example, with certain customers operating in the same industry or customer groups located in the same geographic region. Credit risk related to these types of receivables is managed through credit approval and monitoring procedures. For the year ended December 31, 2024, we did not write off any bad debt on our total sales of $704.5 million but wrote off a nominal amount of bad debt in December 31, 2023.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.

The consolidated financial statements, supplementary information and financial statement schedules of the Company are set forth beginning on page F-1 of this report.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE.

None.

ITEM 9A. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2024. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure.

Management recognized that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of December 31, 2024, our Chief Executive Officer and Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures were not effective because of the material weakness in internal control over financial reporting as discussed below.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act as a process, designed by, or under the supervision of the Company's principal executive and principal financial officers and effected by the Company's board of directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Internal control over financial reporting includes maintaining records that in reasonable detail accurately and fairly reflect our transactions and dispositions of assets; providing reasonable assurance that transactions are recorded as necessary for preparation of our financial statements; providing reasonable assurance that receipts and expenditures are made only in accordance with management and board authorizations; and providing reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2024. In making this assessment, management used the criteria for effective internal control over financial reporting described in the "Internal Control-Integrated Framework" (2013) set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO").

Based on the assessment, management concluded that, as of December 31, 2024, our internal control over financial reporting was not effective.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of a company's annual or interim financial statements will not be prevented or detected on a timely basis.

A material weakness exists in relation to the Company's controls over the accounting of its Zeolyst Joint Venture. The Company does not have sufficient controls designed to ensure its proportionate share of the earnings from the Zeolyst Joint Venture, an equity method investee underlying the Company's financial statements, were completely, accurately, and timely recorded. This material weakness resulted in immaterial adjustments to our equity in net income from affiliated companies and investments in affiliated companies as of and for the fiscal years ended December 31, 2024, 2023 and 2022, and for the interim periods contained within those fiscal years. This material weakness could result in a material misstatement of our equity in net income from affiliated companies and investments in affiliated companies that would not be prevented or detected on a timely basis.

The effectiveness of our internal control over financial reporting as of December 31, 2024 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report, which is included in Item 8.

Plan for Remediation of Material Weakness

We are in the process of developing a plan to remediate the material weakness described above. Our plan will include designing and implementing appropriate controls designed to ensure our proportionate share of the earnings from the Zeolyst Joint Venture are completely, accurately, and timely recorded in our financial statements. This material weakness will not be considered remediated until the applicable controls are designed, implemented and operate for a sufficient period of time and management has concluded, through testing, that these controls are operating effectively.

Changes in Internal Control Over Financial Reporting

No changes in our internal control over financial reporting occurred during the quarter ended December 31, 2024 that materially affected, or which are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION.

Trading Arrangements

During the year ended December 31, 2024, none of the Company's directors or executive officers adopted or terminated a "Rule 10b5-1 trading arrangement" or "non-Rule 10b5-1 trading arrangement," as each item is defined in Item 408(a) of Regulation S-K.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS.

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE.

A copy of our form of insider trading policy is filed as Exhibit 19.1 to this Annual Report on Form 10-K. The remaining information required by this Item 10 will be included in our 2025 Proxy Statement, which we intend to file with the SEC within 120 days of our December 31, 2024 fiscal year end, and is incorporated herein by reference.

ITEM 11. EXECUTIVE COMPENSATION.

The information required by this Item 11 will be included in our 2025 Proxy Statement, which we intend to file with the SEC within 120 days of our December 31, 2024 fiscal year end, and is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS.

The information required by this Item 12 will be included in our 2025 Proxy Statement, which we intend to file with the SEC within 120 days of our December 31, 2024 fiscal year end, and is incorporated herein by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE.

The information required by this Item 13 will be included in our 2025 Proxy Statement, which we intend to file with the SEC within 120 days of our December 31, 2024 fiscal year end, and is incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES.

The information required by this Item 14 will be included in our 2025 Proxy Statement, which we intend to file with the SEC within 120 days of our December 31, 2024 fiscal year end, and is incorporated herein by reference.

PART IV

ITEM 15. EXHIBIT AND FINANCIAL STATEMENT SCHEDULES.

(a) The following documents are filed as part of this report:

(1) and (2) The response to this portion of Item 15 is submitted as a separate section of this report beginning on page F-1. All other schedules have been omitted as inapplicable or are not required, or because the required information is included in the consolidated financial statements or accompanying notes. (3) The exhibits filed as part of this report are listed in the accompanying index.

			Incorporated by Reference			
Exhibit No.	Exhibit Description	Filed Herewith	Form	File No.	Exhibit	Filing Date
2.1	Stock Purchase Agreement, dated as of February 28, 2021, by and among PQ Group Holdings Inc. and Sparta Aggregator L.P.		8-K	001-38221	2.1	03/04/2021
2.2	Amendment No. 1 to Stock Purchase Agreement, dated as of June 24, 2021, by and among PQ Group Holdings Inc. and Sparta Aggregator L.P.		8-K	001-38221	2.1	6/30/2021
2.3	Amendment No. 2 to Stock Purchase Agreement, dated as of July 12, 2021, by and among PQ Group Holdings Inc. and Sparta Aggregator L.P.		8-K	001-38221	2.1	7/15/2021
3.1	Second Restated Certificate of Incorporation		10-Q	001-38221	3.1	11/14/2017
3.2	Certificate of Amendment of Certificate of Incorporation		8-K	001-38221	3.1	8/3/2021
3.3	Certificate of Correction of Certificate of Amendment of Certificate of Incorporation		10-Q	001-38221	3.3	11/9/2021
3.4	Second Amended and Restated Bylaws of Ecovyst Inc.		8-K	001-38221	3.2	8/3/2021
3.5	Certificate of Amendment of Certificate of Incorporation		8-K	001-38221	3.1	5/9/2024
4.1	Indenture, dated as of May 4, 2016, among PQ Corporation, as Issuer, the Guarantors from time to time party thereto and Wells Fargo Bank, National Association, as Trustee and Collateral Agent, including the form of Global Note attached as Exhibit A thereto		S-1	333-218650	4.2	6/9/2017
4.2	Indenture, dated as of December 11, 2017, among PQ Corporation, as Issuer, the guarantors party thereto and Wells Fargo Bank, National Association, as trustee		8-K	001-38221	4.1	12/13/2017
4.3	Description of Ecovyst Inc.'s common stock		10-K	001-38221	4.3	3/1/2022
10.1	Partnership Agreement, dated as of February 1, 1988, by and between PQ Corporation and Shell Polymers and Catalysts Enterprises Inc.		S-1/A	333-218650	10.10	8/14/2017
10.2	First Amendment to Partnership Agreement, dated January 1, 1993, by and among PQ Corporation, Shell Catalyst Ventures Inc. and CRI Zeolites Inc.		S-1/A	333-218650	10.11	8/14/2017
10.3	Second Amendment to Partnership Agreement, dated October 18, 2002, by and between PQ Corporation and Shell Catalyst Ventures Inc.		S-1/A	333-218650	10.12	8/14/2017
10.4	Third Amendment to Partnership Agreement, dated January 1, 2005, by and between PQ Corporation and CRI Zeolites Inc.		S-1/A	333-218650	10.13	8/14/2017
10.5	Form of Amended and Restated Stockholders Agreement between PQ Group Holdings Inc. and certain stockholders of PQ Group Holdings Inc.		S-1/A	333-218650	10.5	9/1/2017
10.6*	Ecovyst Inc. 2017 Omnibus Incentive Plan, as Amended and Restated		S-8	333-262180	4.1	1/14/2022

Exhibit No.	Exhibit Description	Filed Herewith	Incorporated by Reference			
			Form	File No.	Exhibit	Filing Date
10.7*	Form of Stock Option Award Agreement under the Ecovyst Inc. 2017 Omnibus Incentive Plan, as Amended and Restated		10-K	001-38221	10.7	3/1/2022
10.8*	Form of Restricted Stock Award Agreement under the Ecovyst Inc. 2017 Omnibus Incentive Plan, as Amended and Restated		10-K	001-38221	10.8	3/1/2022
10.9*	Form of Restricted Stock Unit Award Agreement under the Ecovyst Inc. 2017 Omnibus Incentive Plan, as Amended and Restated		10-K	001-38221	10.9	3/1/2022
10.10*	Form of 2019 Performance Stock Unit Award Agreement under the Ecovyst Inc. 2017 Omnibus Incentive Plan, as Amended and Restated		10-K	001-38221	10.10	3/1/2022
10.11*	Form of 2020 Performance Stock Unit Award Agreement under the Ecovyst Inc. 2017 Omnibus Incentive Plan, as Amended and Restated		10-K	001-38221	10.11	3/1/2022
10.12*	PQ Group Holdings Inc. Stock Incentive Plan		S-1	333-218650	10.6	6/9/2017
10.13*	Form of Nonqualified Stock Option Award Agreement under the PQ Group Holdings Inc. Stock Incentive Plan		S-1	333-218650	10.7	6/9/2017
10.14*	Form of Restricted Stock Agreement under the PQ Group Holdings Inc. Stock Incentive Plan		S-1	333-218650	10.8	6/9/2017
10.15*	Form of Director and Officer Indemnification Agreement		S-1/A	333-218650	10.9	9/1/2017
10.16*	Severance Agreement, dated September 25, 2017, by and between PQ Corporation and Joseph S. Koscinksi		10-K	001-38221	10.37	2/27/2020
10.17	Term Loan Credit Agreement, dated as of June 9, 2021 among CPQ Midco I Corporation, PQ Corporation, Ecovyst Catalyst Technologies LLC, Eco Services Operations Corp., Credit Suisse AG, Cayman Islands Branch, as administrative agent and collateral agent, and the lenders from time to time party thereto, with Citibank, N.A., Credit Suisse Loan Funding LLC, BofA Securities, Inc., Deutsche Bank Securities Inc., Goldman Sachs Bank USA, KeyBanc Capital Markets Inc. and Truist Securities, Inc., as Joint Lead Arrangers and Joint Bookrunners		8-K	001-38221	10.1	6/11/2021
10.18	Third Amendment Agreement, dated as of June 9, 2021, to the ABL Credit Agreement, dated as of May 4, 2016, by and among PQ Corporation, CPQ Midco I Corporation, the Canadian Borrowers from time to time party thereto, the European Borrowers from time to time party thereto, the Lenders from time to time party thereto and Citibank, N.A., as Administrative Agent and Issuing Bank, with Citigroup Global Markets Inc., Credit Suisse Loan Funding LLC, Bank of America, N.A., Deutsche Bank Securities Inc., Goldman Sachs Bank USA, KeyBanc Capital Markets Inc. and Truist Securities, Inc., as Joint Lead Arrangers and Joint Bookrunners		8-K	001-38221	10.2	6/11/2021
10.19*	Amendment to Form of Director and Officer Indemnification Agreement		10-Q	001-38221	10.3	8/9/2021
10.20*	Form of Ecovyst Inc. Director and Officer Indemnification Agreement		10-Q	001-38221	10.4	8/9/2021
10.21*	Form of 2021 Performance Stock Unit Award Agreement under the Ecovyst Inc. 2017 Omnibus Incentive Plan, as Amended and Restated		10-K	001-38221	10.38	3/1/2022

Exhibit No.	Exhibit Description	Filed Herewith	Incorporated by Reference			
			Form	File No.	Exhibit	Filing Date
10.22 *	Severance Agreement, dated December 16, 2022, between Ecovyst Catalyst Technologies LLC and Kurt J. Bitting		8-K	001-38221	10.1	12/16/2022
10.23*	Severance Agreement, dated December 16, 2022, between Ecovyst Catalyst Technologies LLC and Michael Feehan		8-K	001-38221	10.2	12/16/2022
10.24*	Amended and Restated Severance Agreement, dated December 16, 2022, between Ecovyst Catalyst Technologies LLC and Joseph S. Koscinski		8-K	001-38221	10.3	12/16/2022
10.25	First Amendment Agreement, dated February 9, 2023 to the Term Loan Credit Agreement, dated June 9, 2021, by and among Ecovyst Catalyst Technologies LLC , Ecovyst Midco II Inc, Eco Services Operations Corp and Credit Suisse AG		10-K	001-38221	10.27	2/28/2023
10.26	Fourth Amendment, dated February 17, 2023 to the ABL Credit Agreement, dated May 4, 2016 by and among Ecovyst Catalyst Technologies LLC, Ecovyst Catalyst Technologies UK Limited, Ecovyst Midco II Inc. and Citibank, N.A.		10-K	001-38221	10.28	2/28/2023
10.27*	Letter of employment, dated July 19, 2022, between Ecoservices and George L. Vann		10-K	001-38221	10.30	2/28/2023
10.28*	Letter of employment, dated November 28, 2022, between Ecovyst Catalyst Technologies LLC and Paul Whittleston		10-K	001-38221	10.31	2/28/2023
10.29*	Form of 2024 Performance Stock Unit Award Agreement under the Ecovyst Inc. 2017 Omnibus Incentive Plan, as Amended and Restated		10-Q	001-38221	10.1	5/03/2024
10.30	Second Amendment Agreement, dated as of June 12, 2024, by and among the Borrowers, Ecovyst Midco II Inc., UBS AG Cayman Islands Branch, as administrative agent, and the lenders party thereto.		10-Q	001-38221	10.1	8/02/2024
10.31	Third Amendment Agreement, dated as of January 30, 2025, by and among the Borrowers, Ecovyst Midco II Inc., UBS AG, Stamford Branch, as administrative agent, and the lenders party thereto.		8-K	001-38221	10.1	01/31/2025
19.1	Form of Insider Trading Policy	X				
21.1	Subsidiaries of Ecovyst Inc.	X				
23.1	Consent of PricewaterhouseCoopers LLP related to the consolidated financial statements and financial statement schedule of Ecovyst Inc. as of December 31, 2024 and 2023 and for each of the three years in the period ended December 31, 2024	X				
23.2	Consent of PricewaterhouseCoopers LLP related to the financial statements of Zeolyst International as of December 31, 2024 and 2023 and for each of the three years in the period ended December 31, 2024	X				
31.1	Certification of Chief Executive Officer of Ecovyst Inc. pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	X				
31.2	Certification of Chief Financial Officer of Ecovyst Inc. pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	X				

Exhibit No.	Exhibit Description	Filed Herewith	Incorporated by Reference			
			Form	File No.	Exhibit	Filing Date
32.1	Certification of Chief Executive Officer of Ecovyst Inc. pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	X				
32.2	Certification of Chief Financial Officer of Ecovyst Inc. pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	X				
97.1	Policy relating to Recovery of Erroneously Awarded Compensation		10-K	001-38221	97.1	2/29/2024
101	The following financial statements from the Annual Report on Form 10-K of Ecovyst Inc. for the year ended December 31, 2024, formatted in Inline XBRL: (i) Consolidated Statements of Income, (ii) Consolidated Statements of Comprehensive Income, (iii) Consolidated Balance Sheets, (iv) Consolidated Statements of Stockholders' Equity, (v) Consolidated Statements of Cash Flows, and (vi) Notes to Consolidated Financial Statements, tagged as blocks of text and including detailed tags	X				
104	The cover page from the Annual Report on Form 10-K of Ecovyst Inc. for the year ended December 31, 2024, formatted in Inline XBRL	X				

* Management contract or compensatory plan

ITEM 16. FORM 10-K SUMMARY.

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

ECOVYST INC.

Date: February 28, 2025

By: /s/ MICHAEL FEEHAN
Michael Feehan
Vice President and Chief Financial Officer
(Duly Authorized Officer and Principal Financial and Accounting Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ KURT J. BITTING Kurt J. Bitting	Chief Executive Officer and Director (Principal Executive Officer)	February 28, 2025
/s/ MICHAEL FEEHAN Michael Feehan	Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)	February 28, 2025
/s/ KEVIN M. FOGARTY Kevin M. Fogarty	Chairperson of the Board	February 28, 2025
/s/ DAVID A. BRADLEY David A. Bradley	Director	February 28, 2025
/s/ BRYAN K. BROWN Bryan K. Brown	Director	February 28, 2025
/s/ ANNA CATALANO Anna Catalano	Director	February 28, 2025
/s/ SUSAN F. WARD Susan F. Ward	Director	February 28, 2025
/s/ SARAH LORANCE Sarah Lorance	Director	February 28, 2025
/s/ DONALD ALTHOFF Donald Althoff	Director	February 28, 2025

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Ecovyst Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Ecovyst Inc. and its subsidiaries (the "Company") as of December 31, 2024 and 2023, and the related consolidated statements of (loss) income, of comprehensive (loss) income, of stockholders' equity and of cash flows for each of the three years in the period ended December 31, 2024, including the related notes and schedule I – parent company financial information as of December 31, 2024 and 2023, and for each of the three years in the period ended December 31, 2024 listed in the accompanying index (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2024, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2024 and 2023, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2024 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company did not maintain, in all material respects, effective internal control over financial reporting as of December 31, 2024, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the COSO because a material weakness in internal control over financial reporting existed as of that date related to the ineffective design and maintenance of controls over ensuring the proportionate share of the earnings from the Zeolyst Joint Venture, an equity investee underlying the Company's financial statements, are completely, accurately and timely recorded.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the annual or interim financial statements will not be prevented or detected on a timely basis. The material weakness referred to above is described in Management's Annual Report on Internal Control over Financial Reporting appearing under Item 9A. We considered this material weakness in determining the nature, timing, and extent of audit tests applied in our audit of the 2024 consolidated financial statements, and our opinion regarding the effectiveness of the Company's internal control over financial reporting does not affect our opinion on those consolidated financial statements.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in management's report referred to above. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Goodwill Impairment Assessment — Advanced Materials & Catalysts Reporting Unit

As described in Notes 2 and 14 to the consolidated financial statements, the Company's goodwill balance was $404.1 million as of December 31, 2024, and the goodwill associated with the Advanced Materials & Catalysts reporting unit was $77.5 million. Management is required to test goodwill associated with each of its reporting units for impairment at least annually and whenever events or circumstances indicate that it is more likely than not that goodwill may be impaired. Management performs its annual goodwill impairment test as of October 1. Goodwill is tested for impairment at the reporting unit level. If the carrying value of a reporting unit exceeds its fair value, an impairment charge is recognized. Management determined the fair value of its reporting units using both a market approach and an income, or discounted cash flow, approach. Management estimates reporting unit market approach fair value using publicly traded comparable company values and applies the selected market multiples to each reporting unit's trailing twelve months adjusted earnings before interest, taxes, depreciation and amortization (EBITDA.) Management estimates reporting unit income-based fair value using the discounted cash flow approach, which requires use of significant assumptions including revenue growth rates, operating margin growth rates, the perpetual growth rate, and the discount rate.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment of the Advanced Materials & Catalysts reporting unit is a critical audit matter are (i) the significant judgment by management when developing the fair value estimate of the Advanced Materials & Catalysts reporting unit; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to market multiples, revenue growth rates, operating margin growth rates, and the discount rate; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment assessment, including controls over the valuation of the Advanced Materials & Catalysts reporting unit. These procedures also included, among others (i) testing management's process for developing the fair value estimate of the Advanced Materials & Catalysts reporting unit; (ii) evaluating the appropriateness of the market and income approaches used by management; (iii) testing the completeness and accuracy of underlying data used in the market and income approaches; and (iv) evaluating the reasonableness of the significant assumptions used by management related to market multiples, revenue growth rates, operating margin growth rates, and discount rate. Evaluating management's assumptions related to revenue growth rates and operating margin growth rates involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the Advanced Materials & Catalysts reporting unit; (ii) the consistency with external market and industry data; and (iii) whether the assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in evaluating (i) the appropriateness of the market and income approaches and (ii) the reasonableness of the market multiples and discount rate assumptions.

Investment Impairment Assessment — Zeolyst International

As described in Notes 2 and 10 to the consolidated financial statements, the Company's investments in affiliated companies balance was $349.3 million as of December 31, 2024, of which a substantial portion related to the investment in Zeolyst International. Management evaluates the equity method investments for impairment whenever events or changes in circumstances indicate that the carrying amounts of such investments may be impaired. If a decline in the fair value of an equity method investment is determined to be other than temporary, a loss is recorded in earnings in the current period. During the year ended December 31, 2024, the Company recognized an impairment charge of $65 million on the investment in the Zeolyst Joint Venture, related to the investment in Zeolyst International, to reduce the carrying value of the investment to its estimated fair value. Management estimated the fair value of the investment using a combination of an income, or discounted cash flow approach, and market value approach. Management estimates investments in affiliated companies market approach fair value using publicly traded comparable company values and applies a control premium and the selected market multiples to the investment's trailing twelve months adjusted EBITDA. Management estimates investments in affiliated companies income-based fair value using the discounted cash flow approach, which requires use of significant assumptions including revenue growth rates, operating margin growth rates, a perpetual growth rate, selling, general and administrative expenses growth rates, and a discount rate.

The principal considerations for our determination that performing procedures relating to the investment impairment assessment of Zeolyst International is a critical audit matter are (i) the significant judgment by management when developing the fair value estimate of the investment in Zeolyst International; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to control premium, market multiples, revenue growth rates, operating margin growth rates, perpetual growth rate, selling, general and administrative expenses growth rates, and the discount rate; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge. As described in the "Opinions on the Financial Statements and Internal Control over Financial Reporting" section, a material weakness was identified related to the Company's accounting for the investment in the Zeolyst Joint Venture.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's investments in affiliated companies impairment assessment, including controls over the valuation of the investment in Zeolyst International. These procedures also included, among others (i) evaluating the Company's accounting for its investment in Zeolyst International; (ii) testing management's process for developing the fair value estimate of the investment in Zeolyst International; (iii) evaluating the appropriateness of the market and income approaches used by management; (iv) testing the completeness and accuracy of underlying data used in the market and income approaches; and (v) evaluating the reasonableness of the significant assumptions used by management related to control premium, market multiples, revenue growth rates, operating margin growth rates, perpetual growth rate, selling, general and administrative expenses growth rates, and discount rate. Evaluating management's assumptions related to revenue growth rates, operating margin growth rates, and selling, general and administrative expenses growth rates involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the Zeolyst International business; (ii) the consistency with external market and industry data; and (iii) whether the assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in evaluating (i) the appropriateness of the market and income approaches and (ii) the reasonableness of the control premium, market multiples, perpetual growth rate, and discount rate assumptions.

/s/ PricewaterhouseCoopers LLP
Philadelphia, Pennsylvania
February 28, 2025

We have served as the Company's auditor since 2015.

ECOVYST INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF (LOSS) INCOME
(in thousands, except share and per share amounts)

	Years ended December 31,		
	2024	2023	2022
Sales	$ 704,493	$ 691,118	$ 820,159
Cost of goods sold	502,971	493,153	595,529
Gross profit	201,522	197,965	224,630
Selling, general and administrative expenses	83,876	79,215	85,334
Other operating expense, net	19,552	22,100	34,911
Operating income	98,094	96,650	104,385
Equity in net (income) from affiliated companies	(15,112)	(30,624)	(27,725)
Impairment of investment in affiliated companies	65,000	—	—
Interest expense, net	49,426	44,730	37,217
Debt extinguishment costs	4,560	—	—
Other (income) expense, net	(758)	605	158
(Loss) income before income taxes	(5,022)	81,939	94,735
Provision for income taxes	1,630	10,785	24,940
Net (loss) income from continuing operations	(6,652)	71,154	69,795
Net income from discontinued operations, net of tax	—	—	3,902
Net (loss) income	$ (6,652)	$ 71,154	$ 73,697
Net (loss) income per share:			
Basic (loss) income per share—continuing operations	$ (0.06)	$ 0.60	$ 0.52
Diluted (loss) income per share—continuing operations	$ (0.06)	$ 0.60	$ 0.52
Basic income per share—discontinued operations	$ —	$ —	$ 0.03
Diluted income per share—discontinued operations	$ —	$ —	$ 0.03
Basic (loss) income per share	$ (0.06)	$ 0.60	$ 0.55
Diluted (loss) income per share	$ (0.06)	$ 0.60	$ 0.55
Weighted average shares outstanding:			
Basic	116,719,437	118,367,214	133,601,322
Diluted	116,719,437	119,487,709	135,088,172

See accompanying notes to consolidated financial statements.

ECOVYST INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE (LOSS) INCOME
(in thousands)

	Years ended December 31,		
	2024	2023	2022
Net (loss) income	$ (6,652)	$ 71,154	$ 73,697
Other comprehensive income (loss), net of tax:			
Pension and postretirement benefits	855	1,120	(2,676)
Net (loss) gain from hedging activities	(2,644)	(12,126)	24,382
Foreign currency translation	(4,660)	4,056	(9,922)
Total other comprehensive (loss) income	(6,449)	(6,950)	11,784
Comprehensive (loss) income	$ (13,101)	$ 64,204	$ 85,481

See accompanying notes to consolidated financial statements.

ECOVYST INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(in thousands, except share and per share amounts)

	December 31,	
	2024	2023
ASSETS		
Cash and cash equivalents	$ 146,013	$ 88,365
Accounts receivable, net	77,937	81,314
Inventories, net	57,126	45,115
Derivative assets	6,532	13,419
Prepaid and other current assets	16,106	17,774
Total current assets	303,714	245,987
Investments in affiliated companies	349,308	440,198
Property, plant and equipment, net	569,275	576,904
Goodwill	404,102	404,470
Other intangible assets, net	98,413	116,550
Right-of-use lease assets	33,558	24,281
Other long-term assets	43,951	29,361
Total assets	$ 1,802,321	$ 1,837,751
LIABILITIES		
Current maturities of long-term debt	$ 8,730	$ 9,000
Accounts payable	43,928	40,195
Operating lease liabilities—current	9,267	8,193
Accrued liabilities	53,201	61,693
Total current liabilities	115,126	119,081
Long-term debt, excluding current portion	852,099	858,946
Deferred income taxes	105,395	115,791
Operating lease liabilities—noncurrent	24,189	16,030
Other long-term liabilities	5,052	22,439
Total liabilities	1,101,861	1,132,287
Commitments and contingencies (Note 23)		
EQUITY		
Common stock ($0.01 par); authorized shares 450,000,000; issued shares 140,872,846 and 140,744,045 on December 31, 2024 and 2023, respectively; outstanding shares 116,534,803 and 116,116,895 on December 31, 2024 and 2023, respectively	1,409	1,407
Preferred stock ($0.01 par); authorized shares 50,000,000; no shares issued or outstanding on December 31, 2024 and 2023, respectively	—	—
Additional paid-in capital	1,106,792	1,102,581
Accumulated deficit	(177,508)	(170,856)
Treasury stock, at cost; shares 24,338,043 and 24,627,150 on December 31, 2024 and 2023, respectively	(222,826)	(226,710)
Accumulated other comprehensive loss	(7,407)	(958)
Total equity	700,460	705,464
Total liabilities and equity	$ 1,802,321	$ 1,837,751

See accompanying notes to consolidated financial statements.

ECOVYST INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in thousands, except share data)

	Shares of Common stock	Common stock	Additional paid-in capital	Accum. deficit	Shares of Treasury stock	Treasury stock, at cost	Accum. other comp. income (loss)	Total
Balance, December 31, 2021	137,820,971	$ 1,378	$ 1,073,409	$ (315,707)	(882,213)	$ (12,551)	$ (5,792)	$ 740,737
Net income	—	—	—	73,697	—	—	—	73,697
Other comprehensive income	—	—	—	—	—	—	11,784	11,784
Repurchases of common shares	—	—	—	—	(16,470,763)	(136,741)	—	(136,741)
Tax withholdings on equity award vesting	—	—	—	—	(32,058)	(332)	—	(332)
Stock compensation expense	—	—	17,469	—	—	—	—	17,469
Shares issued under equity incentive plan, net of forfeitures	1,750,301	18	597	—	—	—	—	615
Balance, December 31, 2022	139,571,272	1,396	1,091,475	(242,010)	(17,385,034)	(149,624)	5,992	707,229
Net income	—	—	—	71,154	—	—	—	71,154
Other comprehensive loss	—	—	—	—	—	—	(6,950)	(6,950)
Repurchases of common shares	—	—	—	—	(7,541,494)	(78,718)	—	(78,718)
Tax withholdings on equity award vesting	—	—	—	—	(315,635)	(3,372)	—	(3,372)
Excise tax on repurchase of common shares	—	—	—	—	—	(638)	—	(638)
Stock compensation expense	—	—	16,252	—	—	—	—	16,252
Shares issued under equity incentive plan, net of forfeitures	1,172,773	11	(5,146)	—	615,013	5,642	—	507
Balance, December 31, 2023	140,744,045	1,407	1,102,581	(170,856)	(24,627,150)	(226,710)	(958)	705,464
Net loss	—	—	—	(6,652)	—	—	—	(6,652)
Other comprehensive loss	—	—	—	—	—	—	(6,449)	(6,449)
Repurchases of common shares	—	—	—	—	(552,081)	(5,010)	—	(5,010)
Tax withholdings on equity award vesting	—	—	—	—	(128,801)	(1,218)	—	(1,218)
Stock compensation expense	—	—	14,037	—	—	—	—	14,037
Shares issued under equity incentive plan, net of forfeitures	128,801	2	(9,826)	—	969,989	10,112	—	288
Balance, December 31, 2024	140,872,846	$ 1,409	$ 1,106,792	$ (177,508)	(24,338,043)	$ (222,826)	$ (7,407)	$ 700,460

See accompanying notes to consolidated financial statements.

ECOVYST INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Years ended December 31,		
	2024	2023	2022
Cash flows from operating activities:			
Net (loss) income	$ (6,652)	$ 71,154	$ 73,697
Net income from discontinued operations	—	—	(3,902)
Adjustments to reconcile net (loss) income to net cash provided by operating activities:			
Depreciation	75,282	70,551	65,121
Amortization	14,080	14,047	14,042
Intangible asset impairment charge	3,900	—	—
Amortization of deferred financing costs and original issue discount	1,659	2,076	2,031
Debt extinguishment costs	90	—	—
Foreign currency exchange loss (gain)	339	(589)	978
Deferred income tax (benefit) provision	(7,927)	(17,072)	1,652
Net loss on asset disposals	2,351	4,137	3,594
Stock compensation	14,043	16,031	20,632
Equity in net (income) from affiliated companies	(15,112)	(30,624)	(27,725)
Dividends received from affiliated companies	38,000	28,000	35,000
Impairment of investment in affiliated companies	65,000	—	—
Other, net	(14,331)	647	(2,660)
Working capital changes that provided (used) cash:			
Receivables	3,102	(6,093)	5,503
Inventories	(11,180)	(1,399)	9,902
Prepaids and other current assets	3,437	(985)	5
Accounts payable	2,367	2,351	(10,127)
Accrued liabilities	(18,558)	(14,635)	(7,448)
Net cash provided by operating activities, continuing operations	149,890	137,597	180,295
Net cash provided by operating activities, discontinued operations	—	—	6,311
Net cash provided by operating activities	149,890	137,597	186,606
Cash flows from investing activities:			
Purchases of property, plant and equipment	(68,953)	(65,335)	(58,870)
Investment in non-marketable equity securities	(4,500)	—	—
Payments for business divestiture, net of cash	—	—	(3,744)
Business combinations, net of cash acquired	—	—	(488)
Other, net	—	—	81
Net cash used in investing activities, continuing operations	(73,453)	(65,335)	(63,021)

	Years ended December 31,		
	2024	2023	2022
Cash flows from financing activities:			
Draw down of revolving credit facilities	—	14,500	—
Repayments of revolving credit facilities	—	(14,500)	—
Issuance of long-term debt, net of original issue discount and financing fees	870,817	—	—
Repayments of long-term debt	(879,683)	(9,000)	(9,000)
Repurchases of common shares	(5,010)	(78,717)	(136,741)
Tax withholdings on equity award vesting	(1,218)	(3,372)	(332)
Repayments of financing obligation	(2,957)	(2,847)	(2,692)
Other, net	210	438	579
Net cash used in financing activities, continuing operations	(17,841)	(93,498)	(148,186)
Effect of exchange rate changes on cash and cash equivalents	(948)	(1,319)	(5,368)
Net change in cash and cash equivalents	57,648	(22,555)	(29,969)
Cash and cash equivalents at beginning of period	88,365	110,920	140,889
Cash and cash equivalents at end of period	$ 146,013	$ 88,365	$ 110,920

For supplemental cash flow disclosures, see Note 25.
See accompanying notes to consolidated financial statements.

ECOVYST INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)

1. Background and Basis of Presentation:

Description of Business

Ecovyst Inc. and subsidiaries (the "Company" or "Ecovyst") is a leading integrated and innovative global provider of advanced materials, specialty catalysts and services. The Company supports customers globally through its strategically located network of manufacturing facilities. The Company believes that its products and services contribute to improving the sustainability of the environment.

Basis of Presentation

On August 1, 2021, the Company completed the sale of its Performance Chemicals business for $1,100,000. The financial results of this business are presented as discontinued operations in the consolidated financial statements for the 2022 period presented. See Note 4 to these consolidated financial statements for further information on this transaction.

The Company has two uniquely positioned specialty businesses: Ecoservices provides sulfuric acid recycling to the North American refining industry for the production of alkylate and provides high quality and high strength virgin sulfuric acid for industrial and mining applications. Ecoservices also provides chemical waste handling and treatment services, as well as ex-situ catalyst activation services for the refining and petrochemical industry. Advanced Materials & Catalysts, through its Advanced Silicas business, provides finished silica catalysts, catalyst supports and functionalized silicas necessary to produce high performing plastics and to enable sustainable chemistry, and through the Zeolyst Joint Venture, innovates and supplies specialty zeolites used in catalysts that support the production of sustainable fuels, remove nitrogen oxides from diesel engine emissions and that are broadly applied in refining and petrochemical processes.

Effective November 28, 2023, the Company renamed the Catalyst Technologies segment to Advanced Materials & Catalysts. The segment results and disclosures included in the Company's consolidated financial statements reflect the new segment name for all periods presented. This change to the Company's segment name does not change the Company's consolidated balance sheets, statements of income or cash flows for the prior periods or the way the Company's chief operating decision maker ("CODM," the "Company's Chief Executive Officer," or "CEO") evaluated the business.

The Company's regeneration services product group, which is a part of the Company's Ecoservices segment, typically experiences seasonal fluctuations as a result of higher demand for gasoline products in the summer months and lower demand in the winter months. These demand fluctuations result in higher sales and working capital requirements in the second and third quarters.

The notes to the consolidated financial statements, unless otherwise indicated, are on a continuing operations basis.

ECOVYST INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)

2. Summary of Significant Accounting Policies:

Principles of Consolidation. The consolidated financial statements include the accounts of the Company and its controlled subsidiaries. Investments in affiliated companies are recorded at cost plus any fair value adjustments and the Company's equity in their undistributed earnings. All intercompany transactions have been eliminated.

Foreign Currency Translation. All assets and liabilities of foreign subsidiaries and affiliated companies are translated to U.S. dollars using exchange rates in effect at the balance sheet date. Income and expense items are translated at average exchange rates during the year. Adjustments resulting from translation of the balance sheets and statements of income are included in stockholders' equity as part of accumulated other comprehensive income (loss) ("AOCI"), and are included in earnings only upon the sale or liquidation of the underlying foreign subsidiary or affiliated company.

Foreign currency transaction gains and losses are recognized in earnings based on differences between foreign currency exchange rates on the transaction date and on the settlement date. Adjustments resulting from translation of certain intercompany loans, which are not considered permanent and are denominated in foreign currencies, are included in other expense (income), net in the consolidated statements of income. The Company considers intercompany loans to be of a permanent or long-term nature if management expects and intends that the loans will not be repaid. For the years ended December 31, 2024, 2023 and 2022, all intercompany loan arrangements were determined to be non-permanent based on management's intention as well as actual lending and repayment activity. Therefore, the foreign currency transaction gains or losses associated with the intercompany loans were recorded in the consolidated statements of income for the years ended December 31, 2024, 2023 and 2022.

Net foreign currency exchange (gains) and losses included in other expense (income), net were $339, $(589) and $978 for the years ended December 31, 2024, 2023 and 2022, respectively. The net foreign currency (gains) and losses realized during these years were primarily driven by the remeasurement effects of monetary assets and liabilities, including non-permanent intercompany debt denominated in a foreign currency and translated to U.S. dollars.

Cash and Cash Equivalents. Cash and cash equivalents include highly liquid investments with original terms to maturity of 90 days or less from the time of purchase.

Restricted Cash. Restricted cash, which is restricted as to withdrawal or usage, is classified separately from cash and cash equivalents on the Company's consolidated balance sheets. The Company had no restricted cash balances as of December 31, 2024 and 2023.

Accounts Receivable and Allowance for Credit Losses. Trade accounts receivable are recorded at the invoiced amount and do not bear interest. The allowance for credit losses is the Company's best estimate of the amount of probable credit losses in its existing accounts receivable and is reviewed during each reporting period over their contractual life. The Company recognizes an allowance for credit losses based on historical collection experience, current regional economic and market conditions, the aging of accounts receivable and assessments of current creditworthiness of customers. Account balances are charged against the allowance when the Company believes it is probable that the associated receivables will not be recovered. If the financial condition of the Company's customers were to deteriorate resulting in an impairment of their ability to make payments, additional allowances may be required. The Company does not have any off-balance sheet credit exposure related to its customers. The Company's allowance for credit losses was not material as of December 31, 2024 and 2023.

Inventories. Certain domestic inventories are stated at the lower of cost or market and valued using the last-in, first-out ("LIFO") method. All other inventories are stated at the lower of cost or net realizable value and valued using the weighted average cost or first-in, first-out ("FIFO") methods.

Property, Plant and Equipment. Property, plant and equipment are carried at cost and include expenditures for new facilities, major renewals and betterments. The Company capitalizes the cost of furnace rebuilds as part of property, plant and equipment. Maintenance, repairs and minor renewals are charged to expense as incurred. The Company capitalizes certain internal costs associated with the implementation of purchased software. When property, plant and equipment is retired or otherwise disposed of, the net carrying amount is eliminated with any gain or loss on disposition recognized in earnings at that time.

ECOVYST INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)

Depreciation is provided on the straight-line method based on the estimated useful lives of the assets, which generally range from 15 to 33 years for buildings and improvements and 3 to 10 years for machinery and equipment. Leasehold improvements are depreciated using the straight-line method based on the shorter of the useful life of the improvement or remaining lease term.

The Company capitalizes the interest cost associated with the development and construction of significant new plant and equipment and depreciates that amount over the lives of the related assets. Capitalized interest recorded during the years ended December 31, 2024, 2023 and 2022 was $1,008, $1,964 and $1,442, respectively.

Leases. The Company has operating and finance lease agreements with remaining lease terms as of December 31, 2024 of up to 17 years, including leases of land, buildings, railcars, vehicles, manufacturing equipment and general office equipment. Some leases include options to terminate or extend for one or more years. These options are incorporated in the Company's lease term when it is reasonably certain that the option will be exercised. Some leases include options to purchase, which the Company assesses under the guidance to determine if these leases should be classified as finance lease agreements.

When the Company enters into an arrangement, at inception, the Company determines if the arrangement contains a lease and whether that lease meets the classification criteria of a finance or operating lease. Some of the Company's lease arrangements contain lease components (e.g. minimum rent payments) and non-lease components (e.g. maintenance). The Company accounts for the lease and non-lease components separately based on the estimated standalone price of each component. Certain of the Company's lease agreements include rental payments that are adjusted periodically for an index or rate and these are initially measured using the index or rate in effect at the commencement date. Variable lease expense is recognized in the period in which the obligation for those payments is incurred. The Company's lease agreements do not contain any material residual value guarantees or material restrictive covenants.

The Company recognizes a right-of-use lease asset and lease liability at the lease commencement date based on the present value of the remaining lease payments over the lease term. The Company assesses its leasing arrangements to determine the rate implicit in the lease arrangement. Historically, the Company's leasing arrangements do not contain the information necessary to determine the rate implicit in the lease. As such, the Company utilizes its incremental borrowing rate over the relevant lease term, which is the rate of interest that it would have to pay to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment. The incremental borrowing rate is determined at the lease commencement date and is developed utilizing a readily available market interest rate curve adjusted for the Company's credit quality. The Company has elected to use a portfolio approach to apply its incremental borrowing rate to individual leases based on lease term and geographic jurisdiction. Short-term leases, which have an initial term of twelve months or less, are not recorded on the Company's balance sheet.

Lease expense for operating leases is recognized on a straight-line basis over the lease term. Lease expense for financing leases is bifurcated into two components, with the amortization expense component of the right-of-use asset recognized on a straight-line basis and the interest expense component recognized using the effective interest method over the lease term. The amortization expense component of the right-of-use lease asset is included in cost of goods sold and in selling, general and administrative expenses and the interest expense component is included in interest expense, net on the consolidated statements of income.

Spare Parts. Spare parts are maintained by the Company's facilities to keep machinery and equipment in working order. Spare parts are capitalized and included in other long-term assets. Spare parts are measured at cost and are not depreciated or expensed until utilized; however, reserves may be provided on aged spare parts. When a spare part is utilized as part of an improvement to property, plant and equipment, the carrying value is depreciated over the applicable life once placed in service. Otherwise, the spare part is expensed and charged as a cost of production when utilized.

Investments in Affiliated Companies. Investments in affiliated companies are accounted for using the equity method of accounting if the investment provides the Company with the ability to exercise significant influence, but not control, over the investee. Significant influence is generally deemed to exist if the Company's ownership interest in the voting stock of the investee ranges between 20% and 50%, although other factors, such as representation on the investee's board of directors and the impact of commercial arrangements, are considered in determining whether the equity method of accounting is appropriate. Under the equity method of accounting, the investments in equity-method investees are

recorded in the consolidated balance sheets as investments in affiliated companies, and the Company's share of the investees' earnings or losses, together with other than temporary impairments in value, is recorded as equity in net income from affiliated companies in the consolidated statements of income. Any differences between the Company's cost of an equity method investment and the underlying equity in the net assets of the investment, such as fair value step-ups resulting from acquisitions, are accounted for according to their nature and impact the amounts recognized as equity in net income from affiliated companies in the consolidated statements of income.

The Company evaluates all distributions received from its equity method investments using the nature of distribution approach. Under this approach, the Company evaluates the nature of activities of the investee that generated the distribution. The distributions received are either classified as a return on investment, which is presented as a component of operating activities on the Company's consolidated statements of cash flows, or as a return of investment, which is presented as a component of investing activities on the Company's consolidated statements of cash flows.

The Company evaluates its equity method investments for impairment whenever events or changes in circumstances indicate that the carrying amounts of such investments may be impaired. If a decline in the fair value of an equity method investment is determined to be other than temporary, a loss is recorded in earnings in the current period.

Goodwill and Intangible Assets. Goodwill is an asset representing the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognized. The Company is required to test goodwill associated with each of its reporting units for impairment at least annually and whenever events or circumstances indicate that it is more likely than not that goodwill may be impaired. The Company completed its annual goodwill impairment test as of October 1.

Goodwill is tested for impairment at the reporting unit level. In performing tests for goodwill impairment, the Company is able to use its discretion to first perform an optional qualitative assessment about the likelihood of the carrying value of a reporting unit exceeding its fair value. The qualitative assessment need not be applied to all reporting units. If the Company determines that it is more likely than not that the fair value of a reporting unit is less than its carrying amount based on the qualitative assessment, the Company will perform a quantitative goodwill impairment test to identify the potential goodwill impairment and measure the amount of the goodwill impairment loss, if any, to be recognized for that reporting unit. For the annual assessments in 2024 and 2023, the Company bypassed the option to perform the qualitative assessment and proceeded directly to performing the quantitative goodwill impairment test for each of its reporting units. The quantitative test identifies both the potential existence of impairment and the amount of impairment loss.

In applying the quantitative test, the Company calculates and compares the reporting unit's estimated fair value to its carrying value, including goodwill. If the fair value of a reporting unit exceeds its carrying value, goodwill is not impaired. If the carrying value of a reporting unit exceeds its fair value, an impairment loss is recognized for the amount by which the carrying value exceeds the reporting unit's fair value. An impairment loss cannot exceed the carrying value of goodwill assigned to a reporting unit and the loss establishes a new basis in the goodwill. Subsequent reversal of an impairment loss is not permitted.

For intangible assets other than goodwill, definite-lived intangible assets are amortized over their respective estimated useful lives. Intangible assets with indefinite lives are not amortized, but rather are tested for impairment at least annually or more frequently if events occur or circumstances change that would more likely than not reduce the fair value of the intangible asset below its carrying amount. The Company tests its indefinite-lived intangible assets as of October 1 of each year in conjunction with its annual goodwill impairment test.

Impairment Assessment of Long-Lived Assets. The Company performs an impairment review of property, plant and equipment and definite-lived intangible assets when facts and circumstances indicate that the carrying value of an asset or asset group may not be recoverable from its undiscounted future cash flows. When evaluating long-lived assets for impairment, if the carrying amount of an asset or asset group is found not to be recoverable, a potential impairment loss may be recognized. An impairment loss is measured by comparing the carrying amount of the asset or asset group to its fair value. Fair value is determined using quoted market prices when available, or other techniques including discounted cash flows. The Company's estimates of future cash flows involve assumptions concerning future operating performance, economic conditions and technological changes that may affect the future useful lives of the assets.

ECOVYST INC. AND SUBSIDIARIES
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(Dollars in thousands, except share and per share amounts)

Derivative Financial Instruments. The Company utilizes certain derivative financial instruments to enhance its ability to manage risk, including exposure to interest rate fluctuations that exist as part of ongoing business operations. Derivative instruments are entered into for periods consistent with the related underlying exposures and do not constitute positions independent of those exposures.

All derivatives designated as hedges are recognized on the consolidated balance sheets at fair value. The Company may designate a derivative as a hedge of the fair value of a recognized asset or liability or of an unrecognized firm commitment (fair value hedge), a hedge of a forecasted transaction or the variability of cash flows to be received or paid related to a recognized asset or liability (cash flow hedge), a foreign currency fair-value or cash-flow hedge (foreign currency hedge), or a hedge of a net investment in a foreign operation (net investment hedge). The Company's hedging strategies include derivatives designated as cash flow hedges.

Changes in the fair value of a derivative that is highly effective and that is designated and qualifies as a cash flow hedge are recorded in other comprehensive income and subsequently reclassified into earnings in the same period(s) in which the hedged transaction affects earnings. Changes in the fair value of a derivative that is highly effective and that is designated and qualifies as a hedge of a net investment in a foreign operation are recorded in the foreign currency translation adjustment account within AOCI, where the associated gains and losses will remain until such time that the hedged net investment (foreign subsidiary) is sold or liquidated.

Changes in the fair value of a derivative that is not designated or does not qualify as a hedge are recorded in the consolidated statements of income. Cash flows from derivative instruments are reported in the same cash flow category as the cash flows from the items being hedged.

The Company formally documents all relationships between hedging instruments and hedged items, as well as its risk-management objective and strategy for undertaking various hedge transactions. The Company also formally assesses whether each hedging relationship is highly effective in achieving offsetting changes in fair values or cash flows of the hedged item during the period, both at the inception of the hedge and on an ongoing basis. If it is determined that a derivative is not highly effective as a hedge, or if a derivative ceases to be a highly-effective hedge, hedge accounting is discontinued with respect to that derivative prospectively.

Fair Value Measurements. The Company measures fair value using the guidelines under U.S. generally accepted accounting principles ("GAAP"). An asset's fair value is defined as the price at which the asset could be exchanged in a current transaction between market participants. A liability's fair value is defined as the amount that would be paid to transfer the liability to a market participant, not the amount that would be paid to settle the liability with the creditor. The carrying values of cash, accounts receivable, accounts payable and accrued liabilities approximate fair value due to the short-term nature of these items. See Note 6 to these consolidated financial statements for further information regarding the application of fair value measurements on the Company's recurring and non-recurring bases and Note 16 regarding the fair value of debt.

Treasury Stock. The Company records repurchases of its common stock for treasury at cost. Upon the reissuance of the Company's common stock from treasury, differences between the proceeds from reissuance and the average cost of the treasury stock are credited or charged to capital in excess of par value to the extent of prior credits related to the reissuance of treasury stock. If no such credits exist, the differences are charged to retained earnings. See Note 7 of these consolidated financial statements for further information regarding the Company's treasury stock repurchases.

Revenue Recognition. In determining the appropriate amount of revenue to be recognized as the Company fulfills its obligations under its agreements, the Company performs the following steps: (i) identification of the contract with the customer; (ii) determination of whether the promised goods or services are performance obligations, including whether they are distinct in the context of the contract; (iii) measurement of the transaction price; (iv) allocation of the transaction price to the performance obligations based on estimated selling prices; and (v) recognition of revenue when (or as) the Company satisfies each performance obligation.

The Company identifies a contract when an agreement with a customer creates legally enforceable rights and obligations, which occurs when a contract has been approved by both parties, the parties are committed to perform their respective obligations, each party's rights and payment terms are clearly identified, commercial substance exists and it is probable that the Company will collect the consideration to which it is entitled.

ECOVYST INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)

The Company may recognize revenue from bill-and-hold arrangements initiated by a customer. Under these bill-and-hold arrangements, a customer pays for the goods, but does not take physical possession immediately. The Company considers satisfaction of performance obligations when they have finished manufacturing the products based on the agreed upon specifications in accordance with the order. These products are custom made to each customer's specifications and cannot be made available for use with another customer's order. Once the goods have been segregated in a designated space in the warehouse and the customer has been invoiced, title to the goods and risk of loss has transferred to the customer. The customers have access to their products to inspect and can take possession prior to the scheduled delivery dates.

The Company may offer rebates to customers who have reached a specified volume of optional purchases. The Company recognizes rebates given to customers as a reduction of revenue based on an allocation of the cost of honoring rebates earned and claimed to each of the underlying revenue transactions that result in progress by the customer toward earning the rebate. Rebates are recognized at the time revenue is recorded. The Company measures the rebate obligation based on the estimated amount of sales that will result in a rebate at the adjusted sales price per the respective sales agreement.

Shipping and Handling. Amounts billed to a customer in a sale transaction related to shipping and handling, if any, represent revenues earned for the goods provided and are classified as revenue. Costs related to shipping and handling of products shipped to customers are classified as cost of goods sold. See Note 5 of these consolidated financial statements for disclosures regarding the recognition of revenue for shipping and handling costs that are billed to customers.

Research and Development. Research and development costs of $6,814, $7,797 and $7,232 for the years ended December 31, 2024, 2023 and 2022, respectively, were expensed as incurred and reported in selling, general and administrative expenses in the consolidated statements of income.

Income Taxes. The Company operates within multiple taxing jurisdictions and is subject to tax filing requirements and potential audits within these jurisdictions. The Company uses the asset and liability method in accounting for income taxes. Deferred tax assets and liabilities are recorded for temporary differences between the tax basis of assets and liabilities and their reported amounts in the financial statements, using statutory tax rates in effect for the year in which the differences are expected to reverse. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in the results of operations in the period that includes the enactment date. The Company evaluates its deferred tax assets each period to ensure that estimated future taxable income will be sufficient in character (e.g., capital gain versus ordinary income treatment), amount and timing, to result in their realizability. A valuation allowance is recorded to reduce the carrying amounts of deferred tax assets, unless it is more likely than not that those assets will be realized.

Generally, APB 23 of ASC Topic 740, Income Taxes ("ASC 740"), provides guidance with respect to establishing deferred income taxes on earnings from foreign subsidiaries, to the extent that these earnings are considered to be available for repatriation. Further, ASC 740-30 requires that deferred taxes be established with respect to the earnings of a foreign subsidiary, unless existing tax law provides a means by which the investment in a subsidiary can be recovered tax-free. The Company has determined that it is able to repatriate the non-permanently reinvested earnings of its foreign subsidiaries in a tax-free manner. As such, the Company is able to assert, for purposes of ASC 740-30, that no deferred income taxes are needed with respect to earnings from foreign subsidiaries.

The Company recognizes a financial statement benefit for positions taken for tax return purposes when it will be more likely than not (i.e. greater than 50%) that the positions will be sustained upon tax examination, based solely on the technical merits of the tax positions. Otherwise, no tax benefit is recognized. The tax benefits recognized are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. The Company recognizes potential accrued interest and penalties related to unrecognized tax benefits as a component of income tax expense. Tax examinations are often complex as tax authorities may disagree with the treatment of items reported by the Company and may require several years to resolve. These accrued liabilities represent a provision for taxes that are reasonably expected to be incurred on the basis of available information but which are not certain.

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Environmental Expenditures. Environmental expenditures that pertain to current operations or to future revenues are expensed or capitalized consistent with the Company's capitalization policy for property, plant and equipment. Expenditures that result from the remediation of an existing condition caused by past operations and that do not contribute to current or future revenues are expensed. Liabilities are recognized for remedial activities when the remediation is probable and the cost can be reasonably estimated. Recoveries of expenditures for environmental remediation are recognized as assets only when recovery is deemed probable. See Note 23 to these consolidated financial statements for further information regarding commitments and contingencies.

Deferred Financing Costs. Financing costs incurred in connection with the issuance of long-term debt are deferred and presented as a direct reduction from the related debt instruments on the Company's consolidated balance sheets. Deferred financing costs are amortized as interest expense using the effective interest method over the respective terms of the associated debt instruments.

Stock-Based Compensation. The Company applies the fair value based method to account for stock options, restricted stock awards, restricted stock units and performance stock units issued in connection with its equity incentive plans. Stock-based compensation expense is recognized on a straight-line basis over the vesting periods of the respective awards, and the Company accounts for forfeitures of equity incentive awards as they occur. In connection with the vesting of restricted stock awards, restricted stock units and performance stock units, shares of common stock may be delivered to the Company by employees to satisfy withholding tax obligations at the instruction of the employee award holders. These transactions, when they occur, are accounted for as stock repurchases by the Company, with the shares returned to treasury stock at a cost representing the payment by the Company of the tax obligations on behalf of the employees in lieu of shares for the vesting event. See Note 21 to these consolidated financial statements regarding compensation expense associated with the Company's equity incentive awards.

Pensions and Postretirement Benefits. The Company sponsors two funded defined benefit pension plans that cover certain employees. Benefits for the plans are generally based on average final pay and years of service. The Company's funding policy is to fund the minimum required contributions consistent with statutory requirements based on actuarial computations utilizing the projected unit credit method of calculation. The pension plans' assets include equity and fixed income securities. Certain assumptions are made regarding the occurrence of future events affecting pension costs, such as mortality, withdrawal, disablement and retirement, changes in compensation and benefits, and discount rates to reflect the time value of money.

The major elements in determining pension income and expense are pension liability discount rates and the expected return on plan assets. The Company references rates of return on high quality, fixed income investments when estimating the discount rate, and the expected period over which payments will be made based upon historical experience. The long-term rate of return used to calculate the expected return on plan assets is the average rate of return estimated to be earned on invested funds for providing pension benefits.

In addition to pension benefits, the Company provides certain health care benefits for employees who meet age, participation and length of service requirements at retirement. The Company uses explicit assumptions using the best estimates available of the plan's future experience. Principal actuarial assumptions include: discount rates, present value factors, retirement age, participation rates, mortality rates, cost trend rates, Medicare reimbursement rates and per capita claims cost by age. Current interest rates as of the measurement date are used for discount rates in present value calculations.

The Company also has defined contribution plans covering domestic employees of the Company and certain subsidiaries.

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Contingencies. Certain conditions may exist as of the date the financial statements are issued, which may result in a loss to the Company but which will only be resolved when one or more future events occur or fail to occur. The Company's management and its legal counsel assess such contingent liabilities, and such assessment inherently involves an exercise of judgment. In assessing loss contingencies related to legal proceedings that are pending against the Company or unasserted claims that may result in such proceedings, the Company and legal counsel evaluate the perceived merits of any legal proceedings or unasserted claims as well as the perceived merits of the amount of relief sought or expected to be sought therein. If the assessment of a contingency indicates that it is probable that a loss has been incurred and the amount of the liability can be estimated, then the estimated liability is accrued in the Company's financial statements. If the assessment indicates that a loss contingency is not probable, but is reasonably possible, or is probable but cannot be estimated, then the nature of the contingent liability, together with an estimate of the range of possible loss if determinable and material, would be disclosed. Loss contingencies considered remote are generally not disclosed unless they involve guarantees, in which case the nature of the guarantee would be disclosed, including the approximate term, how the guarantee arose, and the events or circumstances that would require the guarantor to perform under the guarantee.

Use of Estimates. The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Correction of Errors. Net loss for the year ended December 31, 2024 included an adjustment of $1,025 related to the Company's LIFO inventory valuation and an adjustment of $939 for the Company's equity in net income of affiliated companies related to revised Zeolyst International results for the years ended December 31, 2023 and 2022. The total 2024 net benefit of $1,964 from these adjustments was not material to the consolidated financial statements for the current period nor the prior interim or annual periods.

3. New Accounting Standards:

Accounting Standards Recently Adopted

In November 2023, the Financial Accounting Standards Board ("FASB") issued guidance to improve the disclosures related to public business entities reportable segments. This new guidance requires entities to provide information regarding significant segment expenses, especially those segment expenses that are regularly reported to the Company's CODM. The guidance also requires public entities to disclose the nature, type and amounts of other segment items by reportable segment. Public business entities will also have to report all annual disclosures about segments profits or losses that are required by ASC 280 on an interim basis, including the significant segment expenses and other segment items. The new guidance is effective for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024, with early adoption permitted. The Company has applied the guidance as required for the fiscal year ended December 31, 2024.

Accounting Standards Not Yet Adopted

In November 2024, FASB issued guidance requiring public business entities to disclose additional information on the nature of certain expenses presented in the income statement. The new guidance requires tabular disclosure of significant expense categories and qualitative descriptions for amounts not disaggregated from relevant expense categories. Public business entities are required to define selling expenses and disaggregate the components. The new guidance is effective for fiscal years beginning after December 15, 2026 and interim periods within fiscal years beginning after December 15, 2027, with early adoption permitted. The requirements must be applied prospectively however public business entities have the option to apply the guidance retrospectively. The disclosure will be implemented as required for the fiscal year ended December 31, 2027. The Company is currently evaluating the impact of this guidance.

In December 2023, FASB issued guidance to improve disclosures related to incomes taxes. This new guidance requires public business entities to disaggregate information on the effective tax rate reconciliation and income taxes paid to provide greater transparency. Public business entities will be required to provide additional information in specified categories related to effective tax rate reconciliation in tabular form and provide income taxes paid by

jurisdictions, with further disaggregation needed if amounts exceed 5% of the total. The new guidance is effective for fiscal years beginning after December 15, 2024. The disclosure will be implemented as required for the fiscal year ended December 31, 2025. The Company is currently evaluating the impact of this guidance.

In October 2023, FASB issued guidance to amend either presentation or disclosure requirements related to fourteen subtopics in the FASB Accounting Standards Codification, that are currently in the SEC Regulation S-X or Regulation S-K. The new guidance was issued in response to the SEC's ruling on disclosure simplification. For entities subject to existing SEC disclosure requirements, the effective date of each amendment of the topics will be the date that the SEC removes the related disclosure from Regulation S-X or Regulation S-K. The guidance must be applied prospectively, with no early adoption permitted for entities subject to those existing SEC disclosures. The Company is currently evaluating the impact of the new guidance as it pertains to the fourteen subtopics that would impact the business and will apply prospectively once in effect.

In August 2023, FASB issued guidance for entities that meet the definition of a joint venture or a corporate joint venture, to adopt a new basis of accounting upon the formation of the joint venture. The new guidance requires the initial measurement of contributed net assets and liabilities at fair value on the formation date, recognition of goodwill for the difference between the fair value of the joint venture's equity and net assets, and disclosures about the nature and financial impact of the transaction. The new guidance requires prospective application and is effective for all joint ventures that are formed on or after January 1, 2025, with early adoption permitted. Joint ventures that formed before January 1, 2025 may elect to retrospectively apply the new guidance. The Company will apply the guidance to any new joint ventures formed after the effective date.

4. Divestitures:

Performance Chemicals

On February 28, 2021, the Company entered into a definitive agreement to sell its Performance Chemicals business to Sparta Aggregator L.P. (the "Buyer"), a partnership established by Koch Minerals & Trading, LLC and Cerberus Capital Management, L.P. for a purchase price of $1,100,000 subject to certain adjustments including indebtedness, cash, working capital and transaction expenses. The Company completed the sale of its Performance Chemicals business effective on August 1, 2021. The net cash proceeds to the Company from the sale were $978,449 after certain customary adjustments for indebtedness, working capital and cash at the closing of the transaction. In March 2022, the Company made a payment to the buyer for $3,744, representing the final adjustments to the sale price. The Company classified this payment within net cash used in investing activities – continuing operations in the consolidated statements of cash flows.

During the year ended December 31, 2022, the Company recognized $2,409 of other operating expense, net, $6,311 of benefit for income taxes and $3,902 of net income from discontinued operations, net of tax. This related to the sale of the Performance Chemicals business for an income tax benefit upon the finalization of the Company's U.S. income tax returns, partially offset by a tax indemnity claim resulting from the transaction.

Financing Obligation

In connection with the divestiture of the Performance Chemicals business, the Company entered into a five-year contract manufacturing agreement effective on August 2, 2021 with PQ Silicas UK Ltd., a subsidiary of the Buyer, related to a facility in Warrington, United Kingdom. Pursuant to this agreement, the Buyer will manufacture and sell advanced silica finished good products to the Company, which are finished good products sold within the Company's Advanced Materials & Catalysts segment. Additionally, certain machinery, equipment, and other tangible personal property assets identified in the Agreement ("Catalyst Production Assets") owned by the Buyer will be used exclusively in the manufacture of advanced silica products for the Company. The Company did not meet the requirements for a sale-leaseback transaction as described in Accounting Standards Codification 842-40, Leases - Sale-Leaseback Transactions. Under the failed sale-leaseback accounting model, the Company is deemed under GAAP to still own the Catalyst Production Assets, which the Company must continue to reflect in its consolidated balance sheet and depreciate over the

assets' remaining useful lives. The Company recorded a financing obligation of £11,648 (equivalent $16,005) as part of this transaction.

The agreement has an initial term of five years, with an option to renew, as well as an "Option Bill of Sale" which provides for the transfer from the Buyer to the Company of the Catalyst Production Assets upon the Company's exercise of a one-dollar purchase option.

The table below presents the financing obligation assets and liabilities recognized on the consolidated balance sheet as of December 31, 2024 and 2023:

		December 31,	
	Balance Sheet location	2024	2023
Assets			
Financing obligation	Property, plant and equipment, net	$ 14,173	$ 19,878
Total		$ 14,173	$ 19,878
Liabilities			
Current:			
Financing obligation	Accrued liabilities	$ 3,043	$ 2,999
Noncurrent:			
Financing obligation	Other long-term liabilities	1,815	4,927
Total		$ 4,858	$ 7,926

Payments made to the Buyer under the contact manufacturing agreement were $9,171, $8,416 and $7,872 for the years ended December 31, 2024, 2023 and 2022, respectively. Included in these payments were $2,957, $2,847 and $2,692 of principal on the financing obligation for the years ended December 31, 2024, 2023 and 2022, respectively, and $185, $266 and $336 of interest on the financing obligation for the years ended December 31, 2024, 2023 and 2022, respectively. Principal payments are included in financing activities and interest payments are included in operating activities on the Company's consolidated statement of cash flows.

The remaining lease term is 1.6 years with a weighted average discount rate of 2.86% as of December 31, 2024.

Maturities of the financing obligation as of December 31, 2024 are as follows:

Year	Finance Obligation
2025	$ 3,142
2026	1,833
2027	—
2028	—
2029	—
Thereafter	—
Total lease payments	4,975
Less: Interest	117
Total lease liabilities [1]	$ 4,858

(1) Refer to the table above regarding the Company's classification of financing obligation in the Company's consolidated balance sheet as of December 31, 2024.

In addition to the contract manufacturing agreement noted above, the Company also entered into certain supply agreements with the Buyer, as well as a Transition Services Agreement, pursuant to which the Buyer was receiving and performing certain services to provide for the orderly transition of various functions and processes after the closing of the transaction. The services under the Transition Services Agreement include information technology, accounting, tax, financial services, human resources, facilities, and other administrative support services. These services were provided for a period of six months, which ended in January 2022. Billings under the Transition Services Agreement to the Buyer during the year ended December 31, 2022 were immaterial. Those billings are included in selling, general and administrative expenses in the consolidated financial statements for the year ended December 31, 2022.

5. Revenue from Contracts with Customers:

Revenue Recognition Model

As described in Note 2, the Company applies the five-step revenue recognition model to each contract with its customers.

Evidence of a contract between the Company and its customers may take the form of a master service agreement ("MSA"), a MSA in combination with an underlying purchase order, a combination of a pricing quote with an underlying purchase order or an individual purchase order received from a customer. The Company and certain of its customers enter into MSAs that establish the terms, including prices, under which orders to purchase goods may be placed. In cases where the MSA contains a distinct order for goods or contains an enforceable minimum quantity to be purchased by the customer, the Company considers the MSA to be evidence of a contract between the Company and its customer as the MSA creates enforceable rights and obligations. In cases where the MSA does not contain a distinct order for goods, the Company's contract with a customer is the purchase order issued under the MSA. Customers of the Company may also negotiate orders via pricing quotes, which typically detail product pricing, delivery terms and payment information. When a customer procures goods under this method, the Company considers the combination of the pricing quote and the purchase order to create enforceable rights and obligations. Absent either a MSA or pricing quote, the Company considers an individual purchase order remitted by a customer to create enforceable rights and obligations.

The Company identifies a performance obligation in a contract for each promised good that is separately identifiable from other promises in the contract and for which the customer can benefit from the good. The majority of the Company's contracts have a single performance obligation, which is the promise to transfer individual goods to the customer. Single performance obligations are satisfied according to the shipping terms noted within the MSA or purchase order. The Company has certain contracts that include multiple performance obligations under which the purchase price for each distinct performance obligation is defined in the contract.

Revenue from product sales are recorded at the sales price, which includes estimates of variable consideration for which reserves are established and which result from discounts, returns or other allowances that are offered within contracts between the Company and its customers.

The Company recognizes revenues when performance obligations under the terms of a contract with its customer are satisfied, which generally occurs at a point in time by transferring control of a product to the customer. The Company determines the point in time when a customer obtains control of a product and the Company satisfies the performance obligation by considering factors including when the Company has a right to payment for the product, the customer has legal title to the product, the Company has transferred possession of the product, the customer has assumed the risks and rewards of ownership of the product and the customer has accepted the product. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring goods. The Company does not have any significant payment terms as payment is received at, or shortly after, the point of sale.

Ecoservices

Contracts between the Company's Ecoservices segment and its customers are typically evidenced by entering into a MSA which generally has a stated contract term in excess of one year. Though each MSA is unique, the terms typically stipulate promises that the Company has determined represent one distinct performance obligation, which is to provide a specified quantity of regenerated acid.

MSAs within the Ecoservices segment may contain raw material pricing adjustments which are typically based on a commodity index or Ecoservices' cost to acquire the commodity. The Company's exposure to fluctuations in raw material prices is limited, as the majority of pass-through contract provisions reset based on fluctuations in the underlying raw material price. These raw material pass-through provisions reset on a periodic basis and prospectively adjust the raw material cost component of the goods sold to the customer. The Company accounts for the raw material costs on a prospective basis, as the price changes affect the future consideration of the sale of goods.

Certain of the Company's Ecoservices MSAs contain minimum purchase requirements that expire within the calendar year, creating enforceable rights and obligations during the period of the minimum purchase requirement. In cases where the MSA contains an enforceable minimum quantity to be purchased by the customer, the Company considers the MSA to be evidence of a contract between the Company and its customer as the MSA creates enforceable right and obligations. The Company reviews each contract with minimum purchase requirements to determine if the customer will meet the provisions within the current calendar year. During the years ended December 31, 2024, 2023 and 2022, there have been no material issues in which Ecoservices customers failed to meet their contractual obligations.

Advanced Materials & Catalysts

The Company's Advanced Materials & Catalysts segment sells customized products to its customers through its Advanced Silicas product group. These customized products are reformulations of existing Advanced Materials & Catalysts products, tailored to meet individual customer specifications. Prior to entering into an arrangement, the Company will allow a customer to obtain a sample of goods to ensure that it meets their needs. The customer will enter into a long-term supply arrangement that outlines the specification of the products to be sold and contains terms and conditions under which purchase orders are issued. These supply arrangements typically have a duration from one to ten years. Although the duration of these supply arrangements are in excess of one year, a contract is formed between the Company and its customer upon receipt of a purchase order.

Contract Assets and Liabilities

A contract asset is a right to consideration in exchange for goods that the Company has transferred to a customer when that right is conditional on something other than the passage of time. A contract liability exists when the Company receives consideration in advance of the fulfillment of its performance obligations. The Company has no contract assets or material contract liabilities recorded on its consolidated balance sheets as of December 31, 2024 and 2023, respectively.

Practical Expedients and Accounting Policy Elections

The Company has elected to use certain practical expedients and has made certain accounting policy elections as permitted under the revenue recognition guidance. The majority of the Company's contracts with customers are based on an individual purchase order or a MSA in combination with an individual purchase order; thus, the duration of these contracts are for one year or less. As described above, the Company's performance obligations reset either monthly or at the end of the calendar year. The Company has made an accounting policy election to omit certain disclosures related to these performance obligations, as the initial term of the Company's performance obligations are for a term of one year or less.

The Company uses an output method to recognize revenues related to performance obligations satisfied over time. These performance obligations, as described above, are satisfied within a calendar year. As such, the Company has elected to utilize the "as-invoiced" practical expedient, which permits the Company to recognize revenue in the amount to which it has a right to invoice the customer, provided that the amount corresponds directly with the value provided by the performance obligation as completed to date.

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When the Company performs shipping and handling activities after the transfer of control to the customer (e.g. when control transfers prior to delivery), they are considered fulfillment activities as opposed to separate performance obligations, and the Company recognizes revenue upon the transfer of control to the customer. Accordingly, the costs associated with these shipping and handling activities are accrued when the related revenue is recognized under the Company's policy election. The Company does not utilize sales-based commissions plans, and as a result, the Company does not capitalize any costs which could be considered incremental costs of obtaining a contract. Sales, value added and other taxes the Company collects concurrent with revenue producing activities are excluded from revenues.

Disaggregated Revenue

The Company's primary means of disaggregating revenues is by reportable segments, which can be found in Note 13 to these consolidated financial statements.

The Company's portfolio of products is integrated into a variety of end uses, which are described in the table below.

Key End Uses	Key Products
Clean fuels, emission control & other	• Refining hydrocracking catalysts
	• Emission control catalysts
	• Catalyst supports used in production of sustainable fuels such as renewable diesel
	• Catalysts used in production of sustainable aviation fuels
	• Catalyst activation
	• Aluminum sulfate solution
	• Ammonium bisulfite solution
Polyethylene, polymers & engineered plastics	• Catalysts and catalyst supports for high-density polyethylene and chemicals syntheses
	• Antiblock for film packaging
	• Catalyst for advanced recycling
Regeneration and treatment services	• Sulfuric acid regeneration services
	• Hazardous waste treatment services
Industrial, mining & automotive	• Virgin sulfuric acid for mining
	• Virgin sulfuric derivatives for industrial production
	• Virgin sulfuric derivatives for nylon production

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The following tables disaggregate the Company's sales, by segment and end uses, for the years ended December 31, 2024, 2023 and 2022, respectively:

	Year ended December 31, 2024		
	Ecoservices	Advanced Materials & Catalysts[2]	Total
Clean fuels, emission control & other	$ 33,996	$ —	$ 33,996
Polyethylene, polymers & engineered plastics	—	106,198	106,198
Regeneration and treatment services[1]	357,376	—	357,376
Industrial, mining & automotive	206,923	—	206,923
Total segment sales	$ 598,295	$ 106,198	$ 704,493

	Year ended December 31, 2023		
	Ecoservices	Advanced Materials & Catalysts[2]	Total
Clean fuels, emission control & other	$ 29,850	$ —	$ 29,850
Polyethylene, polymers & engineered plastics	—	106,273	106,273
Regeneration and treatment services[1]	354,606	—	354,606
Industrial, mining & automotive	200,388	—	200,388
Total segment sales	$ 584,844	$ 106,273	$ 691,117

	Year ended December 31, 2022		
	Ecoservices	Advanced Materials & Catalysts[2]	Total
Clean fuels, emission control & other	$ 28,966	$ —	$ 28,966
Polyethylene, polymers & engineered plastics	—	117,687	117,687
Regeneration and treatment services[1]	342,645	—	342,645
Industrial, mining & automotive	330,861	—	330,861
Total segment sales	$ 702,472	$ 117,687	$ 820,159

(1) As described in Note 1 to these consolidated financial statements, the Company experiences seasonal sales fluctuations to customers in the regeneration services product group.

(2) The Company does not record its proportionate share of sales from the Zeolyst Joint Venture accounted for using the equity method as revenue and such sales are not consolidated within its results of operations. See Note 10 to these consolidated financial statements for further information.

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6. Fair Value Measurements:

Fair values are based on quoted market prices when available. When market prices are not available, fair values are generally estimated using discounted cash flow analyses, incorporating current market inputs for similar financial instruments with comparable terms and credit quality. In instances where there is little or no market activity for the same or similar instruments, the Company estimates fair values using methods, models and assumptions that management believes a hypothetical market participant would use to determine a current transaction price. These valuation techniques involve some level of management estimation and judgment that becomes significant with increasingly complex instruments or pricing models. Where appropriate, adjustments are included to reflect the risk inherent in a particular methodology, model or input used.

The Company's financial assets and liabilities carried at fair value have been classified based upon a fair value hierarchy. The hierarchy gives the highest ranking to fair values determined using unadjusted quoted prices in active markets for identical assets and liabilities (Level 1) and the lowest ranking to fair values determined using methodologies and models with unobservable inputs (Level 3). The classification of an asset or a liability is based on the lowest level input that is significant to its measurement. For example, a Level 3 fair value measurement may include inputs that are both observable (Levels 1 and 2) and unobservable (Level 3). The levels of the fair value hierarchy are as follows:

- Level 1—Values are unadjusted quoted prices for identical assets and liabilities in active markets accessible at the measurement date. Active markets provide pricing data for trades occurring at least weekly and include exchanges and dealer markets.
- Level 2—Inputs include quoted prices for similar assets or liabilities in active markets, quoted prices from those willing to trade in markets that are not active, or other inputs that are observable or can be corroborated by market data for the term of the instrument. Such inputs include market interest rates and volatilities, spreads and yield curves.
- Level 3—Certain inputs are unobservable (supported by little or no market activity) and significant to the fair value measurement. Unobservable inputs reflect the Company's best estimate of what hypothetical market participants would use to determine a transaction price for the asset or liability at the reporting date.

Fair value on a recurring basis

The following tables present information about the Company's assets and liabilities that were measured at fair value on a recurring basis as of December 31, 2024 and 2023, and indicates the fair value hierarchy of the valuation techniques the Company utilized to determine such fair value.

	December 31, 2024	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Derivative assets:				
Interest rate caps (Note 18)	$ 12,500	$ —	$ 12,500	$ —
Derivative liabilities:				
Interest rate caps (Note 18)	$ 710	$ —	$ 710	$ —

	December 31, 2023	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Derivative assets:				
Interest rate caps (Note 18)	$ 19,021	$ —	$ 19,021	$ —
Derivative liabilities:				
Interest rate caps (Note 18)	$ 2,496	$ —	$ 2,496	$ —

Derivative contracts

Derivative assets and liabilities can be exchange-traded or traded over-the-counter ("OTC"). The Company generally values exchange-traded derivatives using models that calibrate to market transactions and eliminate timing differences between the closing price of the exchange-traded derivatives and their underlying instruments. OTC derivatives are valued using market transactions and other market evidence whenever possible, including market-based inputs to models, model calibration to market transactions, broker or dealer quotations or alternative pricing sources with reasonable levels of price transparency. When models are used, the selection of a particular model to value an OTC derivative depends on the contractual terms of, and specific risks inherent in, the instrument as well as the availability of pricing information in the market. The Company generally uses similar models to value similar instruments. Valuation models require a variety of inputs, including contractual terms, market prices and rates, forward curves, measures of volatility, and correlations of such inputs. For OTC derivatives that trade in liquid markets, such as forward contracts, swaps and options, model inputs can generally be corroborated by observable market data by correlation or other means, and model selection does not involve significant management judgment.

As of December 31, 2024, the Company had interest rate caps that were fair valued using Level 2 inputs. In addition, the Company applies a credit valuation adjustment to reflect credit risk which is calculated based on credit default swaps. To the extent that the Company's net exposure under a specific master agreement is an asset, the Company utilizes the counterparty's default swap rate. If the net exposure under a specific master agreement is a liability, the Company utilizes a default swap rate comparable to Ecovyst. The credit valuation adjustment is added to the discounted fair value to reflect the exit price that a market participant would be willing to receive to assume the Company's liabilities or that a market participant would be willing to pay for the Company's assets.

Fair value on a non-recurring basis

Non-marketable equity securities

The Company's non-marketable equity securities consist of an investment in a privately-held company without readily determinable market values. Non-marketable equity securities are accounted for using the measurement alternative, defined as cost less impairment, if any, plus or minus adjustments from observable price changes for identical or similar securities of the same issuer. Adjustments to fair value or impairments, if any, are recorded in the consolidated statements of income.

On July 24, 2024, the Company paid $4,500 for a minority equity investment in Pajarito Powder LLC ("Pajarito"), an innovative materials science company that focuses on supports and catalysts required for the manufacture and operation of electrolyzers and fuel cells. The investment is recorded in other long-term assets in the consolidated balance sheet and within cash flows from investing activities in the consolidated statements of cash flows.

As of December 31, 2024, the carrying value in Pajarito was $4,500. There was no remeasurement events or recognized gains or losses for the year ended December 31, 2024.

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7. Stockholders' Equity:

Accumulated Other Comprehensive Loss

The following table presents the components of AOCI, net of tax, as of December 31, 2024 and 2023:

	December 31,	
	2024	2023
Amortization and unrealized gains on pension and postretirement plans, net of tax expense of $(4,628) and $(4,344) respectively	$ 1,467	$ 612
Net changes in fair values of derivatives, net of tax expense of $(3,504) and $(4,385) respectively	9,901	12,546
Foreign currency translation adjustments	(18,775)	(14,116)
AOCI	$ (7,407)	$ (958)

The following table presents the tax effects of each component of other comprehensive income (loss) for the years ended December 31, 2024, 2023 and 2022:

	Years ended December 31,								
	2024			2023			2022		
	Pre-tax amount	Tax benefit/ (expense)	After-tax amount	Pre-tax amount	Tax benefit/ (expense)	After-tax amount	Pre-tax amount	Tax benefit/ (expense)	After-tax amount
Defined benefit and other postretirement plans:									
Net gain (loss)	$ 1,169	$ (291)	$ 878	$ 1,511	$ (297)	$ 1,214	$ (3,344)	$ 826	$ (2,518)
Net prior service cost	(30)	7	(23)	(125)	31	(94)	(210)	52	(158)
Benefit plans, net	1,139	(284)	855	1,386	(266)	1,120	(3,554)	878	(2,676)
Net (loss) gain from hedging activities	(3,525)	881	(2,644)	(17,312)	5,186	(12,126)	33,194	(8,812)	24,382
Foreign currency translation	(4,660)	—	(4,660)	4,056	—	4,056	(9,922)	—	(9,922)
Other comprehensive (loss) income	$ (7,046)	$ 597	$ (6,449)	$ (11,870)	$ 4,920	$ (6,950)	$ 19,718	$ (7,934)	$ 11,784

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The following table presents the changes in AOCI, net of tax, by component for the years ended December 31, 2024 and 2023:

	Defined benefit and other postretirement plans	Net gain (loss) from hedging activities	Foreign currency translation	Total
December 31, 2022	$ (508)	$ 24,672	$ (18,172)	$ 5,992
Other comprehensive income before reclassifications	1,085	5,031	4,056	10,172
Amounts reclassified from AOCI[1]	35	(17,157)	—	(17,122)
Net current period other comprehensive income (loss)	1,120	(12,126)	4,056	(6,950)
December 31, 2023	612	12,546	(14,116)	(958)
Other comprehensive income (loss) before reclassifications	883	10,254	(4,660)	6,477
Amounts reclassified from AOCI[1]	(28)	(12,898)	—	(12,926)
Net current period other comprehensive income (loss)	855	(2,644)	(4,660)	(6,449)
December 31, 2024	$ 1,467	$ 9,902	$ (18,776)	$ (7,407)

(1) See the following table for details about these reclassifications. Amounts in parentheses indicate debits.

The following table presents the reclassifications out of AOCI for the years ended December 31, 2024 and 2023.

Details about AOCI Components	Amount reclassified from AOCI[1] Years ended December 31, 2024	2023	Affected line item where Income is presented
Amortization of defined benefit and other postretirement items:			
Net loss	$ 8	$ 59	Other (expense) income[2]
Net prior service cost (credit)	30	(125)	Other (expense) income[2]
	38	(66)	Total before tax
	(10)	31	Tax benefit (expense)
	$ 28	$ (35)	Net of tax
Gains and losses on cash flow hedges:			
Interest rate caps	$ 17,197	$ 22,731	Interest expense
	(4,299)	(5,574)	Tax expense
	12,898	17,157	Net of tax
Total reclassifications for the period	$ 12,926	$ 17,122	Net of tax

(1) Amounts in parentheses indicate debits to profit/loss.

(2) These AOCI components are components of net periodic pension and other postretirement cost. See Note 20 to these consolidated financial statements for additional details.

Treasury Stock Repurchases

2022 Stock Repurchase Program

On April 27, 2022, the Board approved a stock repurchase program that authorized the Company to purchase up to $450,000 of the Company's common stock over the four-year period from the date of approval. Under the plan, the Company is permitted to repurchase shares from time to time for cash in open market transactions or in privately negotiated transactions with an equity sponsor in accordance with applicable federal securities laws, with the Company determining the timing and the amount of any repurchases based on its evaluation of market conditions, share price and other factors.

During the year ended December 31, 2024, the Company repurchased 552,081 shares on the open market at an average price of $9.05 per share, for a total of $4,998, excluding brokerage commissions and accrued excise tax. As of December 31, 2024, $229,594 was available for share repurchases under the program. During the year ended December 31, 2024, the Company did not need to accrue excise tax related to these repurchases, net of shares issued under the Company's equity incentive program (see Note 19 to these consolidated financial statements).

During the year ended December 31, 2023, the Company repurchased 541,494 shares on the open market at an average price of $9.85 per share, for a total of $5,333, excluding brokerage commissions and accrued excise tax. Additionally, in connection with secondary offerings of the Company's common stock by an equity sponsor in March and May 2023, the Company repurchased 7,000,000 shares of its common stock sold in the offerings from the underwriters at a weighted average price of $10.48 per share concurrently with the closing of the offerings, for a total of $73,373, excluding accrued excise tax. During the year ended December 31, 2023, the Company accrued excise tax of $638 related to these repurchases, net of shares issued under the Company's equity incentive program. This amount is included in accrued liabilities in the consolidated balance sheet and is treated by the Company as a cost of the treasury stock transactions in equity.

Tax Withholdings on Equity Award Vesting

In connection with the vesting of restricted stock awards ("RSA" or "RSAs"), restricted stock units ("RSU" or "RSUs") and performance stock units ("PSU" or "PSUs"), shares of common stock may be delivered to the Company by employees to satisfy withholding tax obligations at the instruction of the employee award holders. These transactions, when they occur, are accounted for as stock repurchases by the Company, with the shares returned to treasury stock at a cost representing the payment by the Company of the tax obligations on behalf of the employees in lieu of shares for the vesting event. There were 128,801 and 315,635 shares delivered to the Company to cover tax payments for the years ended December 31, 2024 and 2023, respectively and the fair value of those shares withheld were $1,218 and $3,372 for the years ended December 31, 2024 and 2023, respectively.

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8. Other Operating Expense, Net:

A summary of other operating expense, net is as follows:

	Years ended December 31,		
	2024	2023	2022
Amortization expense	$ 10,585	$ 10,565	$ 10,562
Transaction and other related costs	428	2,954	6,988
Restructuring, integration and business optimization costs[1]	955	2,655	11,566
Net loss on asset disposals	2,351	4,137	3,594
Intangible asset impairment charge (Note 14)	3,900	—	—
Other, net	1,333	1,789	2,201
Total operating expense, net	$ 19,552	$ 22,100	$ 34,911

[1] During the year ended December 31, 2022, the Company's results were impacted by costs associated with severance charges for certain former executives and employees. The severance charges were not related to a specific restructuring plan of the Company, but rather were incurred primarily in connection with the leadership transition in April 2022 and the retirement of several executives.

9. Inventories, Net:

Inventories, net are classified and valued as follows:

	December 31,	
	2024	2023
Finished products and work in process	$ 54,124	$ 41,658
Raw materials	3,002	3,457
Total inventory, net	$ 57,126	$ 45,115
Valued at lower of cost or market:		
LIFO basis	$ 31,650	$ 24,815
Valued at lower of cost and net realizable value:		
FIFO or average cost basis	25,476	20,300
Total inventory, net	$ 57,126	$ 45,115

The domestic inventory acquired as a result of the combination of the businesses of PQ Holdings Inc. and Eco Services Operations LLC in May 2016 ("the 2016 business combination") is valued based on the LIFO method. Therefore, the fair value allocated to the acquired LIFO inventory was treated as the new base inventory value. If inventories valued under the LIFO basis had been valued using the FIFO method, inventories would have been $5,700 and $3,529 lower than reported as of December 31, 2024 and 2023, respectively, driven primarily by the purchase accounting fair value step-up of the LIFO inventory base value associated with the 2016 business combination.

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10. Investments in Affiliated Companies:

The Company accounts for investments in affiliated companies under the equity method. Affiliated companies accounted for on the equity basis as of December 31, 2024 are as follows:

Company	Country	Percent Ownership
Zeolyst International	USA	50%
Zeolyst C.V.	Netherlands	50%

Following is summarized information of the combined investments[1]:

	December 31,	
	2024	2023
Current assets	$ 254,541	$ 291,825
Noncurrent assets	166,999	183,717
Current liabilities	27,226	36,799
Noncurrent liabilities	5,649	5,797

	December 31,		
	2024	2023	2022
Sales	$ 286,283	$ 345,002	$ 306,511
Gross profit	78,043	107,865	105,693
Operating income	37,230	70,783	67,169
Net income	37,746	74,053	68,255

[1] Summarized information of the combined investments is presented at 100%; the Company's share of the net assets and net income of affiliates is calculated based on the percent ownership specified in the table above.

The Company's investments in affiliated companies balance as of December 31, 2024 and 2023 includes net purchase accounting fair value adjustments of $155,138 and $224,614, respectively, related to the 2016 business combination consisting primarily of goodwill and intangible assets such as customer relationships, technical know-how and trade names. Consolidated equity in net income from affiliates is net of $3,761, $6,403 and $6,402 of amortization expense related to purchase accounting fair value adjustments for the years ended December 31, 2024, 2023 and 2022, respectively. During the year ended December 31, 2024, the Company recognized a $65,000 other than temporary impairment charge on its investment in the Zeolyst Joint Venture to reduce the carrying value of the Company's investment to its estimated fair value. This impairment was an adjustment to the goodwill and trade name components of the purchase accounting fair value adjustments recorded as a result of the 2016 business combination.

The Company had receivables due from affiliates of $2,794 and $3,231 as of December 31, 2024 and 2023, respectively, which were included in prepaid and other current assets in the consolidated balance sheets. The Company had payables from affiliates of $929 and $1,351 as of December 31, 2024 and 2023, which were included in accrued liabilities in the consolidated balance sheets. Receivables and payables due from affiliates are generally non-trade.

Sales to affiliates were $3,811, $2,457 and $5,915 for the years ended December 31, 2024, 2023 and 2022, respectively. There were no purchases from affiliates during the years ended December 31, 2024 and 2022, respectively and $236 for the year ended December 31, 2023.

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The Advanced Materials & Catalysts segment includes equity in net income from Zeolyst International and Zeolyst C.V. (collectively, the "Zeolyst Joint Venture"), each of which are 50/50 joint ventures with CRI Zeolites Inc. (a wholly-owned subsidiary of Royal Dutch Shell). The Zeolyst Joint Venture is accounted for using the equity method in the Company's consolidated financial statements. The Company's management evaluates the Advanced Materials & Catalysts segment's performance, including the Zeolyst Joint Venture, on a proportionate consolidation basis.

The Company's equity in net income from affiliated companies in the consolidated results includes amortization expense related to purchase accounting fair value adjustments associated with the Zeolyst Joint Venture as a result of the 2016 business combination. The Company's consolidated results include equity in net income from affiliated companies of $15,112, $30,624 and $27,725 for the years ended December 31, 2024, 2023 and 2022, respectively. This represents the primary component of equity in net income in the Advanced Materials & Catalysts segment from the Zeolyst Joint Venture.

During the year ended December 31, 2024, the Company recognized an other than temporary impairment charge of $65,000 on its investment in the Zeolyst Joint Venture, specifically related to our investment in Zeolyst International, to reduce the carrying value of the Company's investment to its estimated fair value. This impairment was a partial reduction to the goodwill and trade name components of the purchase accounting fair value adjustments recorded as a result of the 2016 business combination. The Company estimated the fair value of the investment using a combination of an income and market value approach, using level 3 inputs. The Company estimated market approach fair value using publicly traded comparable company values and applied a control premium and the selected market multiples to the investee's trailing twelve months Adjusted EBITDA. The Company estimated income-based fair value using the discounted cash flow approach. This approach requires the use of significant assumptions about future cash flows and is based on management's assessment of a number of factors. The key assumptions include revenue growth rates, operating margin growth rates, the perpetual growth rate, selling, general and administrative expenses growth rates and the weighted average cost of capital, as well as the investee's recent performance and its ability to execute on planned future strategic initiatives. Discount rate assumptions are based on an assessment of the risk inherent in those future cash flows. The fair value declined primarily due to the demand outlook for catalyst materials used in emission control applications and the production of sustainable fuels, which has resulted in revised projections of future operating results.

The following table summarizes the activity related to the Company's investments in affiliated companies balance on the consolidated balance sheets:

	December 31,	
	2024	2023
Balance at beginning of period	$ 440,198	$ 436,013
Equity in net income of affiliated companies	18,873	37,027
Charges related to purchase accounting fair value adjustments	(3,761)	(6,403)
Dividends received	(38,000)	(28,000)
Impairment of investment in affiliated companies	(65,000)	—
Foreign currency translation adjustments	(3,002)	1,561
Balance at end of period	$ 349,308	$ 440,198

In December 2013 and annually thereafter, the Company and its joint venture, Zeolyst International, entered into ten year real estate tax abatement agreements with the Unified Government of Wyandotte County in Kansas City, Kansas (the "Unified Government"). The agreements utilize an Industrial Revenue Bond ("IRB," "IRBs") financing structure to achieve a 75% real estate tax abatement on the value of the improvements that were constructed during the expansion of the then-current fiscal year to the Company and Zeolyst International's facilities at the jointly-operated Kansas City, Kansas plant. The IRB financing structure requires the Company to lease its rights to the facility improvements to the Unified Government, which leases the improvements back to the Company. The Company's rental payments under the sub-leases of the improvements are equal to the amount of the interest payable on the IRBs that the Unified Government sells to the Company. The Company's sublease payment obligations and the IRB interest payment receivables have been

presented net, as the sublease rental payment obligations and the IRB interest payment receivables meet the criteria for right of set off conditions under GAAP.

11. Property, Plant and Equipment:

A summary of property, plant and equipment, at cost, and related accumulated depreciation is as follows:

	December 31,	
	2024	2023
Land	$ 97,163	$ 96,833
Buildings and improvements	94,324	84,860
Machinery and equipment	872,875	820,509
Construction in progress	40,868	42,000
Property, plant and equipment, gross	1,105,230	1,044,202
Less: accumulated depreciation	(535,955)	(467,298)
Total property, plant and equipment, net	$ 569,275	$ 576,904

Depreciation expense was $75,282, $70,551 and $65,121 for the years ended December 31, 2024, 2023 and 2022, respectively.

12. Leases:

Operating lease costs of $10,997, $10,828 and $10,318 are included in cost of goods sold and in selling, general and administrative expenses on the consolidated statements of income for the years ended December 31, 2024, 2023 and 2022, respectively. Finance lease costs of $74, $77 and $36 are included in cost of goods sold and in selling, general, and administrative expenses on the consolidated statement of income for the years ended December 31, 2024, 2023 and 2022, respectively. Lease income is not material to the results of operations for the years ended December 31, 2024, 2023 and 2022, respectively.

The table below presents the operating and finance leases right-of-use assets and liabilities recognized on the consolidated balance sheet as of December 31, 2024 and 2023:

	Balance Sheet location	December 31, 2024	December 31, 2023
Assets			
Operating lease	Right-of-use lease assets	$ 33,558	$ 24,281
Finance lease	Property, plant and equipment, net	1,116	1,269
Total leased assets		$ 34,674	$ 25,550
Liabilities			
Current:			
Operating lease	Operating lease liabilities—current	$ 9,267	$ 8,193
Finance lease	Accrued liabilities	23	70
Noncurrent:			
Operating lease	Operating lease liabilities—noncurrent	24,189	16,030
Finance lease	Other long-term liabilities	—	28
Total leased liabilities		$ 33,479	$ 24,321

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The Company's weighted average remaining lease term and weighted average discount rate for operating and financing leases as of December 31, 2024 and 2023 are as follows:

	December 31,	
	2024	2023
Weighted average remaining lease term (in years):		
Operating leases	4.73	3.96
Finance leases	0.44	1.33
Weighted average discount rate:		
Operating leases	6.22 %	5.95 %
Finance leases	4.09 %	3.91 %

Maturities of lease liabilities as of December 31, 2024 are as follows:

Year	Operating Leases	Finance Leases
2025	$ 10,979	$ 23
2026	8,813	—
2027	6,928	—
2028	4,423	—
2029	3,020	—
Thereafter	4,595	—
Total lease payments	38,758	23
Less: Interest	(5,302)	—
Total lease liabilities [1]	$ 33,456	$ 23

[1] Refer to the above table regarding the Company's right-of-use lease assets and lease liabilities for the classification of lease liabilities in the Company's consolidated balance sheet as of December 31, 2024.

The following table presents other information related to the Company's operating and finance leases and the impact on the Company's consolidated statement of cash flows:

	Years ended December 31,	
	2024	2023
Cash paid for amounts included in the measurement of lease liabilities:		
Payments on operating leases included in operating cash flows	$ 10,996	$ 10,813
Interest payments under finance leases included in operating cash flows	2	5
Principal payments under finance leases included in financing cash flows	76	72
Right-of-use assets obtained in exchange for new lease liabilities (non-cash):		
Operating leases	18,612	8,105

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13. Reportable Segments:

Sales

The Company has organized its business around two operating segments based on the review of discrete financial results for each of the operating segments by the CODM, for performance assessment and resource allocation purposes. Each of the Company's operating segments represents a reportable segment under GAAP. The Company's reportable segments are organized based on the nature and economic characteristics of the Company's products. The Company's two reportable segments are as follows: (1) Ecoservices, which provides sulfuric acid recycling to the North American refining industry for the production of alkylate and provides on-purpose virgin sulfuric acid for water treatment, mining and industrial applications; and (2) Advanced Materials & Catalysts, which serves the polymers and engineered plastics and the global refining, petrochemical and emissions control industries.

The following table summarizes sales for the Company's reportable segments:

	Years ended December 31,		
	2024	2023	2022
Sales:			
Ecoservices	$ 598,295	$ 584,845	$ 702,472
Advanced Materials & Catalysts[1]	106,198	106,273	117,687
Total	$ 704,493	$ 691,118	$ 820,159

(1) The Company does not record its proportionate share of sales from the Zeolyst Joint Venture accounted for using the equity method as revenue and such sales are not consolidated within its results of operations. See Note 10 to these consolidated financial statements for further information. The Company's proportionate share of sales from the Zeolyst Joint Venture is $116,539, $156,481 and $132,588 for the years ended December 31, 2024, 2023 and 2022, respectively.

Adjusted EBITDA

The Company's management evaluates the operating results of each reportable segment based upon adjusted earnings before interest, income taxes, depreciation and amortization ("Adjusted EBITDA"). The Company defines Adjusted EBITDA as EBITDA, which is a measure defined as net income before interest, income taxes, depreciation and amortization (each of which is included in the Company's consolidated statements of income), adjusted for certain items as noted in the reconciliations below. Adjusted EBITDA should not be considered as an alternative to net income or as an indicator of the Company's operating performance. Adjusted EBITDA, as defined by the Company, may not be comparable with EBITDA or Adjusted EBITDA as defined by other companies.

For each reportable segment, the CODM uses segment Adjusted EBITDA to allocate resources (including employees, property and financial or capital resources) for each segment primarily in the annual budget and forecasting process. The CODM considers budget-to-actual variances on a monthly basis when making decisions about allocating capital and personnel to the segments. The CODM also uses segment Adjusted EBITDA to evaluate the return on assets of each segment in connection with performance evaluation and to inform the compensation for certain employees. Corporate overhead costs are not included in segment results as they relate to corporate-based responsibilities and decisions and are not included in the internal measures of segment operating performance used by the Company to measure the underlying performance of the operating segments.

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The following table summarizes Adjusted EBITDA for the Company's reportable segments:

	Years ended December 31,		
	2024	2023	2022
Adjusted EBITDA:			
Ecoservices	$ 200,287	$ 199,966	$ 227,760
Advanced Materials & Catalysts[1]	64,728	81,892	77,978
Adjusted EBITDA from reportable segments	$ 265,015	$ 281,858	$ 305,738

(1) The Adjusted EBITDA for the Company's Advanced Materials & Catalysts segment reflects the Company's 50% portion of the earnings from the Zeolyst Joint Venture that have been recorded as equity in net income in its consolidated statements of income and includes Zeolyst Joint Venture adjustments on a proportionate basis based on the Company's 50% ownership interest. For the year ended December 31, 2024, the Adjusted EBITDA from the Zeolyst Joint Venture included in the Advanced Materials & Catalysts segment was $32,212, which includes $15,112 of equity in net income plus $3,761 of amortization of investment in affiliate step-up and $13,339 of joint venture depreciation, amortization and interest.

For the year ended December 31, 2023, the Adjusted EBITDA from the Zeolyst Joint Venture included in the Advanced Materials & Catalysts segment was $50,490, which includes $30,695 of equity in net income plus $6,403 of amortization of investment in affiliate step-up and $13,392 of joint venture depreciation, amortization and interest.

For the year ended December 31, 2022, the Adjusted EBITDA from the Zeolyst Joint Venture included in the Advanced Materials & Catalysts segment was $50,331, which includes $27,931 of equity in net income plus $6,403 of amortization of investment in affiliate step-up and $15,997 of joint venture depreciation, amortization and interest.

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The following tables reconcile sales to Adjusted EBITDA from reportable segments:

	Year ended December 31, 2024		
	Ecoservices	Advanced Materials & Catalysts	Total
Sales[2]	$ 598,295	$ 106,198	
Less:[3]			
Cost of goods sold	373,839	58,752	
Selling, general and administrative expenses	25,636	14,354	
Other segment items[4]	(1,467)	576	
Add:			
Adjusted EBITDA from the Zeolyst Joint Venture	—	32,212	
Adjusted EBITDA from reportable segments	$ 200,287	$ 64,728	$ 265,015

	Year ended December 31, 2023		
	Ecoservices	Advanced Materials & Catalysts	Total
Sales[2]	$ 584,845	$ 106,273	
Less:[3]			
Cost of goods sold	361,958	60,035	
Selling, general and administrative expenses	23,615	14,255	
Other segment items[4]	(694)	581	
Add:			
Adjusted EBITDA from the Zeolyst Joint Venture	—	50,490	
Adjusted EBITDA from reportable segments	$ 199,966	$ 81,892	$ 281,858

	Year ended December 31, 2022		
	Ecoservices	Advanced Materials & Catalysts	Total
Sales[2]	$ 702,472	$ 117,687	
Less:[3]			
Cost of goods sold	454,602	77,933	
Selling, general and administrative expenses	20,713	12,428	
Other segment items[4]	(603)	(321)	
Add:			
Adjusted EBITDA from the Zeolyst Joint Venture	—	50,331	
Adjusted EBITDA from reportable segments	$ 227,760	$ 77,978	$ 305,738

(2) The Company does not record its proportionate share of sales from the Zeolyst Joint Venture accounted for using the equity method as revenue and such sales are not consolidated within its results of operations. See Note 10 to these consolidated financial statements for further information. The Company's proportionate share of sales from the Zeolyst Joint Venture is $116,539, $156,481 and $132,588 for the years ended December 31, 2024, 2023 and 2022, respectively.

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(3) The significant expense categories and amounts align with the segment-level information that is regularly provided to the CODM. All lines exclude depreciation, amortization and other items as noted in the reconciliation below.

(4) Other segment items include other operating (income) expense, foreign currency exchange (gains) losses and other (income) expense. Other income primarily relates to sale of environmental credits.

The following table reconciles Adjusted EBITDA from reportable segments to income from continuing operations before income taxes:

	Years ended December 31,		
	2024	2023	2022
Adjusted EBITDA from reportable segments	$ 265,015	$ 281,858	$ 305,738
Less:			
Interest expense, net	49,426	44,730	37,217
Depreciation and amortization	89,362	84,598	79,163
Unallocated corporate expenses	26,776	21,990	29,042
Joint venture depreciation, amortization and interest	13,339	13,392	15,997
Amortization of investment in affiliate step-up	3,761	6,403	6,402
Impairment of investment in affiliated companies	65,000	—	—
Intangible asset impairment charge	3,900	—	—
Debt extinguishment costs	4,560	—	—
Net loss on asset disposals	2,351	4,137	3,594
Foreign currency exchange (gain) loss	(182)	(1,340)	1,388
LIFO (benefit) expense	(2,171)	3,473	(165)
Transaction and other related costs	428	2,954	6,988
Equity-based compensation	14,043	16,031	20,632
Restructuring, integration and business optimization expenses	955	2,655	11,566
Other	(1,511)	896	(821)
(Loss) income before income taxes	$ (5,022)	$ 81,939	$ 94,735

Capital Expenditures

The following table shows capital expenditures for the Company's reportable segments:

	Years ended December 31,		
	2024	2023	2022
Capital expenditures:			
Ecoservices	$ 54,689	$ 53,705	$ 47,770
Advanced Materials & Catalysts[1]	14,712	8,441	8,194
Other[2]	(448)	3,189	2,906
Capital expenditures per the consolidated statements of cash flows	$ 68,953	$ 65,335	$ 58,870

(1) Excludes the Company's proportionate share of capital expenditures from the Zeolyst Joint Venture.

(2) Includes the cash impact from changes in capital expenditures in accounts payable and capitalized interest.

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Sales by Geography

Sales by geographic area are presented in the following table. Sales are attributed to countries based upon location of products shipped.

	Years ended December 31,		
	2024	2023	2022
Sales[1]:			
United States	$ 666,342	$ 649,652	$ 774,119
Foreign countries	38,151	41,466	46,040
Total	$ 704,493	$ 691,118	$ 820,159

[1] Except for the United States, no sales in an individual country exceeded 10% of the Company's total sales.

Sales by Customers

The Company sold products through its Ecoservices and Advanced Materials & Catalysts segments to two customers having 10% or more of total net sales. Customer A accounted for 13.6%, 13.2% and 12.3% of the Company's total net sales for the years ended December 31, 2024, 2023 and 2022, respectively. Customer B accounted for 11.1% of total net sales for the year ended December 31, 2024 and was less than 10% for the years ended December 31, 2023 and 2022, respectively.

Long-lived Assets by Geography

Long-lived assets by geographic area is presented in the following table. Long-lived assets includes property, plant and equipment, net and right-of-use lease assets.

	December 31,	
	2024	2023
Long-lived assets:		
United States	$ 578,450	$ 575,536
Foreign countries	24,383	25,649
Total	$ 602,833	$ 601,185

Total assets by segment are not disclosed by the Company because the information is not prepared or used by the CODM to assess performance or to allocate resources.

14. Goodwill and Other Intangible Assets:

The changes in the carrying amount of goodwill for the years ended December 31, 2024 and 2023 is summarized as follows:

	Ecoservices	Advanced Materials & Catalysts	Total
Balance as of December 31, 2022	$ 326,589	$ 76,574	$ 403,163
Foreign exchange impact	—	1,307	1,307
Balance as of December 31, 2023	326,589	77,881	404,470
Foreign exchange impact	—	(368)	(368)
Balance as of December 31, 2024	$ 326,589	$ 77,513	$ 404,102

The Company completed its annual goodwill impairment test as of October 1, 2024 and 2023. For the annual assessments, the Company bypassed the option to perform the qualitative assessment and proceeded directly to performing the quantitative goodwill impairment test for each of its reporting units. The quantitative test identifies both the potential existence of impairment and the amount of impairment loss. For each of the October 1, 2024 and 2023 assessments, the Company identified two reporting units, which align with the Company's operating segments.

The Company determined the fair value of its reporting units using both a market approach and an income, or discounted cash flow, approach. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

The Company estimates reporting unit market approach fair value using publicly traded comparable company values and applies the selected market multiples to each reporting unit's trailing twelve months Adjusted EBITDA. The Company estimates reporting unit income-based fair value using the discounted cash flow approach. This approach requires use of significant assumptions about future cash flows and based on management's assessment of a number of factors. Such factors include reporting unit revenue growth rates from implementation of strategic plans, operating margin growth rates, the perpetual growth rate, and the weighted average cost of capital, as well as the reporting unit's recent performance and management's ability to execute on planned future strategic initiatives. Discount rate assumptions are based on an assessment of the risk inherent in those future cash flows.

As of October 1, 2024, the fair values of each of the Company's reporting units exceeded their respective carrying values and therefore, no goodwill impairment exists for the year ended December 31, 2024. Although the estimated fair value of the Advanced Materials & Catalysts reporting unit exceeded its carrying value by approximately 15%, the Company has experienced unfavorable effects on current operations resulting from certain macroeconomic and industry factors in specific end uses during the year ended December 31, 2024. Prolonged unfavorable effects could adversely impact the estimated fair value of the Advanced Materials & Catalysts reporting unit in future periods and may result in impairment charges.

In addition to the annual goodwill impairment assessment, the Company also performed the annual impairment test over its other indefinite-lived intangible assets as of October 1, 2024 and 2023. As part of the October 1, 2024 test, the Company recognized an impairment charge of $3,900 related to the Advanced Materials & Catalysts in-process research and development ("IPR&D") intangible asset upon the conclusion that the associated project could no longer support the valuation due to extended time to commercialization and reductions in associated forecasted revenues. The fair values of the Company's indefinite-lived trade names were in excess of their carrying amounts as of the respective testing dates, and as such, there was no further impairment of the Company's indefinite-lived intangible assets for the years ended December 31, 2024 and 2023.

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Gross carrying amounts and accumulated amortization for intangible assets other than goodwill are as follows:

	December 31, 2024				December 31, 2023		
	Gross Carrying Amount	Accumulated Amortization	Impairment Charge	Net Balance	Gross Carrying Amount	Accumulated Amortization	Net Balance
Technical know-how	$ 55,217	$ (30,907)	$ —	$ 24,310	$ 55,350	$ (27,472)	$ 27,878
Customer relationships	130,834	(86,348)	—	44,486	130,912	(76,634)	54,278
Non-compete agreements	700	(537)	—	163	700	(397)	303
Trademarks	7,484	(4,324)	—	3,160	7,521	(3,844)	3,677
Trade names	1,600	(613)		987	1,600	(453)	1,147
Total definite-lived intangible assets	195,835	(122,729)	—	73,106	196,083	(108,800)	87,283
Indefinite-lived trade names	25,307	—	—	25,307	25,367	—	25,367
IPR&D	3,900	—	(3,900)	—	3,900	—	3,900
Total intangible assets	$ 225,042	$ (122,729)	$ (3,900)	$ 98,413	$ 225,350	$ (108,800)	$ 116,550

The Company amortizes technical know-how over periods that range from ten years to twenty years, customer relationships over periods that range from ten years to fifteen years, non-compete agreements over five years, trademarks over fifteen years, and trade names over ten years. IPR&D intangible assets are considered indefinite-lived until such time as the associated projects are completed, at which time amortization commences on the assets, or abandoned, which results in the impairment of the assets.

Amortization expense related to technical know-how is included in cost of goods sold in the consolidated statements of income and was $3,495, $3,482 and $3,480 for the years ended December 31, 2024, 2023 and 2022, respectively. Amortization expense related to customer relationships, non-compete agreements, trademarks, and trade names is included in other operating expense, net in the consolidated statements of income and was $10,585, $10,565 and $10,562 for the years ended December 31, 2024, 2023 and 2022, respectively.

Estimated future aggregate amortization expense of intangible assets is as follows:

Year	Amount
2025	$ 14,067
2026	12,912
2027	12,370
2028	12,221
2029	10,033
Thereafter	11,503
Total estimated future aggregate amortization expense	$ 73,106

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15. Accrued Liabilities:

The following table summarizes the components of accrued liabilities as follows:

	December 31,	
	2024	2023
Compensation and bonus	$ 22,530	$ 16,594
Interest	10,190	11,976
Property tax	2,039	3,657
Environmental reserves (Note 23)	783	434
Income taxes	2,094	7,708
Finance lease and financing obligation liabilities	3,065	3,069
Dividends payable	—	641
Derivative liabilities	235	—
Other	12,265	17,614
Total accrued liabilities	$ 53,201	$ 61,693

16. Long-term Debt:

The summary of long-term debt is as follows:

	December 31,	
	2024	2023
2024 Term Loan Facility	$ 870,817	$ 877,500
ABL Facility	—	—
Total debt	870,817	877,500
Original issue discount	(7,201)	(6,162)
Deferred financing costs	(2,787)	(3,392)
Total debt, net of original issue discount and deferred financing costs	860,829	867,946
Less: current portion	(8,730)	(9,000)
Total long-term debt, excluding current portion	$ 852,099	$ 858,946

Term Loan Facility

On June 9, 2021, PQ Corp and Ecovyst Catalyst Technologies LLC ("Ecovyst LLC" and, following the closing of the sale of the Performance Chemicals business, the "Borrower"), an indirect, wholly owned subsidiary of the Company, entered into an agreement (the "2021 Credit Agreement") for the 2021 Term Loan Facility in an aggregate principal amount of $900,000 with an original issue discount of 0.25% and interest at a floating rate of LIBOR (with a 0.50% minimum LIBOR floor) plus 2.75% per annum (or, depending on the Borrower's first lien net leverage ratio, 2.50%). The 2021 Term Loan Facility required scheduled quarterly amortization payments, each equal to 0.25% of the original principal amount of the loans under the 2021 Term Loan Facility. The proceeds of the 2021 Term Loan Facility were used to pay in full the senior secured term loan facility we entered into an agreement in 2020, partially pay the senior secured term loan facility the Company entered into an agreement in 2018 and pay the associated fees and expenses.

On February 9, 2023, the Company amended the 2021 Term Loan Facility to replace LIBOR with a Secured Overnight Financing Rate ("SOFR") as the benchmark interest rate. Following this amendment, the 2021 Term Loan Facility bear interest at an adjusted SOFR rate (with a 0.50% minimum floor) plus 2.75% per annum (or, depending on the Borrower's first lien net leverage ratio, 2.50%).

On June 12, 2024, the Company amended the 2021 Term Loan Facility to, among other things, (a) reduce the interest rate applicable to all outstanding SOFR term loans to term SOFR plus 2.25% per annum from a maximum of adjusted term SOFR plus 2.75% per annum, (b) reduce the interest rate applicable to all outstanding base rate term loans to the alternate base rate plus 1.25% per annum from a maximum of the alternate base rate plus 1.75% per annum and (c) extend the maturity date of all outstanding term loans to June 12, 2031 (the amended term loans, the "2024 Term Loan Facility"). As a result of the amendment, there is no longer a credit spread adjustment of 10 basis points.

On January 30, 2025, the Company amended the 2024 Term Loan Facility to, among other things, (a) reduce the interest rate applicable to all outstanding SOFR term loans to term SOFR plus 2.00% per annum from a maximum of term SOFR plus 2.25% per annum and (b) reduce the interest rate applicable to all outstanding base rate term loans to the alternate base rate plus 1.00% per annum from a maximum of the alternate base rate plus 1.25% per annum.

The interest rate on the 2024 Term Loan Facility was 6.84% as of December 31, 2024.

The 2024 Term Loan Facility is guaranteed by Ecovyst Catalyst Technologies LLC and Ecoservices Operations Corp, as well as other material U.S. subsidiaries of the Company. The obligations under the 2024 Term Facility are secured (i) by a first-priority security interest in, among other things, a pledge of substantially all of the Borrower's and the guarantors' assets (other than collateral securing the ABL Facility on a first-priority basis) and (ii) by a second-priority security interest in receivables, inventory, deposit accounts and other collateral of the Borrower and the U.S. subsidiary guarantors securing the ABL Facility.

The Company may at any time voluntarily prepay loans under the 2024 Term Loan Facility in whole or in part without premium or penalty (other than a premium that would be payable in the event of a repricing of the 2024 Term Loan Facility occurring on or prior to July 30, 2025).

Debt extinguishment costs resulting from Term Loan amendments

In June 2024, the Company evaluated the terms of the amendment in accordance with *ASC 470-50 Debt - Modification and Extinguishment* and determined that the amendment was primarily a modification of debt. As a result, the Company recorded $4,471 of third-party financing costs as debt extinguishment costs in the consolidated income statement for the year ended December 31, 2024 and capitalized $2,183 of original issued discount within long-term debt, excluding current portion on the consolidated balance sheets as of December 31, 2024. In addition, previous unamortized deferred financing costs of $30 and original issue discount of $59 associated with the previously outstanding debt were written off as debt extinguishment costs for the year ended December 31, 2024.

In January 2025, the Company re-priced the 2024 Term Loan Facility to reduce the applicable interest rate. The terms of the facility were substantially consistent following the re-pricing, except that borrowings under the facility will bear interest at a rate equal to term SOFR plus 2.00% per annum.

ABL Facility

On May 4, 2016, PQ Corporation ("PQ Corp"), an indirect, wholly owned subsidiary of the Company prior to the closing of the sale of the Performance Chemical business entered into a $200,000 senior secured asset-based revolving credit facility (the "ABL Facility"), which provided for $200,000 revolving credit commitments.

On March 20, 2020, PQ Corp amended its existing ABL Facility to increase the aggregate amount of the revolving loan commitments available by $50,000 to $250,000, consisting of up to $195,000 in U.S. commitments, up to $15,000 in Canadian commitments and up to $40,000 in European commitments. The maturity of the facility was extended to March 20, 2025. In addition, there was an annual commitment fee equal to 0.375%, with a step-down to 0.25% based on average usage of the revolving credit borrowings available

Following the amendment, the borrowings under the amended ABL Facility bear interest at a rate equal to the LIBOR rate or the base rate plus a margin of between 1.25% to 1.75% or 0.25% to 0.75%, respectively.

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On June 9, 2021, PQ Corp and Ecovyst LLC (as defined below) entered into a third amendment agreement (the "ABL Amendment"), which amended its ABL Credit Agreement, dated as of May 4, 2016 (the "ABL Credit Agreement" and, as amended by the ABL Amendment, the "Amended ABL Credit Agreement"). The ABL Amendment, among other things, following the sale of Performance Chemicals, decreased the aggregate amount of revolving loan commitments available to the borrowers thereunder by an aggregate amount of $150,000 to $100,000, consisting of $90,000 in U.S. commitments and $10,000 in European commitments and extended the maturity date with respect to borrowings under the Amended ABL Credit Agreement to August 2, 2026.

On February 17, 2023, the Company amended the ABL Facility to replace LIBOR with SOFR as the benchmark interest rate. Following this amendment, the borrowings under the ABL Facility bears interest at a rate equal to an adjusted term SOFR, which includes a credit spread adjustment of 10 basis points or the base rate plus a margin of between 1.25% to 1.75% or 0.25% to 0.75%, respectively. The interest rate on the ABL Facility was 7.75% as of December 31, 2024.

As of December 31, 2024, there were no revolving credit borrowings outstanding under the ABL Facility. Revolving credit borrowings are payable at the option of the Borrower throughout the term of the ABL Facility with the balance due August 2, 2026. The Company has the ability to request letters of credit under the ABL Facility. The Company had $3,330 of letters of credit outstanding as of December 31, 2024, which reduce available borrowings under the ABL Facility by such amounts.

The obligations of the Borrower under the ABL Facility are guaranteed by the same U.S. subsidiary guarantors that guarantee the 2024 Term Loan Facility (as described below) and the obligations of the European Borrowers under the ABL Facility are guaranteed by a certain European subsidiary of the Borrower. The obligations of the borrowers and guarantors under the ABL Facility are secured (i) by a first-priority security interest in, among other things, substantially all of their receivables, inventory, deposit accounts and other collateral securing the ABL Facility on a first-priority basis and (ii) by a second-priority security interest in the property and assets of the Borrower and the U.S. subsidiary guarantors that secure the 2024 Term Loan Facility. In addition, the ABL Facility is secured by the equity interests in, and substantially all of the assets of, certain foreign guarantors in connection with the Euro-denominated availability.

The ABL Facility and the 2024 Term Loan Facility contain various restrictive covenants. Each limits the ability of the Borrower and its restricted subsidiaries to incur certain indebtedness or liens, merge, consolidate or liquidate, dispose of certain property, make investments or declare or pay dividends, make optional payments, modify certain debt instruments, enter into certain transactions with affiliates, enter into certain sales and leasebacks, and certain other non-financial restrictive covenants. The ABL Facility also contains one financial covenant which applies when minimum availability under the ABL Facility exceeds a certain threshold. During such time, the Company is required to maintain a fixed-charge coverage ratio of at least 1.0 to 1.0. The Company was in compliance with all debt covenants as of December 31, 2024 and 2023, respectively.

Fair Value of Debt

The fair value of a financial instrument is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants. As of December 31, 2024 and 2023, the fair value of the Company's term loan facility was $874,083 and $876,403, respectively. The fair value is classified as Level 2 based upon the fair value hierarchy (see Note 6 to these consolidated financial statements for further information on fair value measurements).

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Aggregate Long-term Debt Maturities

The aggregate long-term debt maturities are:

Year	Amount
2025	$ 8,730
2026	8,730
2027	8,730
2028	8,730
2029	8,730
Thereafter	827,167
	$ 870,817

17. Other Long-term Liabilities:

The following table summarizes the components of other long-term liabilities as follows:

	December 31,	
	2024	2023
Pension plan liabilities	$ 2,122	$ 4,937
Other postretirement benefit plan liabilities	442	457
Derivative liabilities	475	2,496
Finance lease and financing obligation liabilities	1,815	4,955
Reserve for uncertain tax positions	110	9,523
Other	88	71
Total other long-term liabilities	$ 5,052	$ 22,439

18. Financial Instruments:

The Company uses interest rate related derivative instruments to manage its exposure to changes in interest rates on its variable-rate debt instruments. The Company does not speculate using derivative instruments.

By using derivative financial instruments to hedge exposures to changes in interest rates, the Company exposes itself to credit risk and market risk. Credit risk is the failure of the counterparty to perform under the terms of the derivative contract. When the fair value of a derivative contract is an asset, the counterparty owes the Company, which creates credit risk for the Company. When the fair value of a derivative contract is a liability, the Company owes the counterparty and therefore, the Company is not exposed to the counterparty's credit risk in those circumstances. The Company minimizes counterparty credit risk in derivative instruments by entering into transactions with high quality counterparties. The derivative instruments entered into by the Company do not contain credit-risk-related contingent features.

Market risk is the adverse effect on the value of a derivative instrument that results from a change in interest rates. The market risk associated with the Company's derivative instruments is managed by establishing and monitoring parameters that limit the types and degree of market risk that may be undertaken.

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Use of Derivative Financial Instruments to Manage Interest Rate Risk. The Company is exposed to fluctuations in interest rates on its senior secured credit facilities. Changes in interest rates will not affect the market value of such debt but will affect the Company's interest payments over the term of the loans. Likewise, an increase in interest rates could have a material impact on the Company's consolidated statements of cash flows. The Company hedges the interest rate fluctuations on debt obligations through interest rate cap agreements. The Company records these agreements at fair value as assets or liabilities in the consolidated balance sheets. As the derivatives are designated and qualify as cash flow hedges, the gains or losses on the interest rate cap agreements are recorded in stockholders' equity as a component of other comprehensive income, net of tax. Reclassifications of the gains and losses on the interest rate cap agreements into earnings are recorded as part of interest expense in the consolidated statements of income as the Company makes its interest payments on the hedged portion of its senior secured credit facilities. Fair value is determined based on estimated amounts that would be received or paid to terminate the contracts at the reporting date based on quoted market prices.

The following table provides a summary of the Company's interest rate cap agreements:

Financial instrument	Number of instruments	In effect as of December 31, 2024	Current notional amount of instruments in effect	Annuitized premium of instruments in effect
Interest rate cap	4	3	$ 625,000	$ 35,285

The current notional amounts of the three interest rate cap agreements in effect at December 31, 2024 are $250,000, $175,000 and $200,000. The Company entered into a $250,000 interest rate cap to mitigate interest rate volatility from September 2023 to October 2025, a $175,000 interest rate cap agreement to mitigate interest rate volatility from August 2024 to July 2026 and a $200,000 interest rate cap agreement to mitigate interest rate volatility from November 2024 to October 2025. The Company had a $150,000 interest rate cap agreement to mitigate interest rate volatility from August 2023 to July 2024. The $200,000 interest rate cap agreement will increase to $450,000 to mitigate interest rate volatility from November 2025 to October 2026. The cap rates in effect at December 31, 2024 was 1.00%.

The Company also entered into a $200,000 forward starting interest rate cap agreement to mitigate interest volatility from August 2026 to July 2028.

In February 2023, the Company amended all existing interest rate cap agreements to replace LIBOR with SOFR as the benchmark interest rate, with all other terms of the agreements remaining the same. This amendment changed the previously annuitized premiums on the existing interest rate cap agreements.

The fair values of derivative instruments held as of December 31, 2024 and 2023, respectively are shown below:

	Balance sheet location	December 31, 2024	December 31, 2023
Derivative assets:			
Derivatives designated as cash flow hedges:			
Interest rate caps	Prepaid and other current assets	$ 6,532	$ 13,419
Interest rate caps	Other long-term assets	5,968	5,602
Total derivative assets		$ 12,500	$ 19,021
Derivative liabilities:			
Derivatives designated as cash flow hedges:			
Interest rate caps	Accrued liabilities	$ 235	$ —
Interest rate caps	Other long-term liabilities	475	2,496
Total derivative liabilities		$ 710	$ 2,496

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The following tables show the effect of the Company's derivative instruments designated as cash flow hedges on AOCI and the consolidated statements of income for the years ended December 31, 2024, 2023 and 2022, respectively:

	Amount of gain (loss) recognized in OCI	
	December 31,	
	2024	2023
Interest rate caps	$ 13,672	$ 5,419

	Amount of gain (loss) reclassified from AOCI	
	December 31,	
	2024	2023
Interest rate caps	$ (17,197)	$ (22,731)

	Amount of (gain) loss reclassified into Income		
	Years ended December 31,		
	2024	2023	2022
Interest rate caps	$ 17,197	$ 22,731	$ (683)

The following table shows the amounts for the line items presented on the consolidated statements of income in which the effects of cash flow hedges are recorded for the years ended December 31, 2024, 2023 and 2022, respectively:

		Years ended December 31,		
	Location and amount of gain (loss) recognized in income on cash flow hedging relationships	2024	2023	2022
Derivatives designated as cash flow hedges:				
Interest rate caps	Interest (expense) income	$ (49,426)	$ (44,730)	$ (37,217)

The amount of net unrealized gains in AOCI related to the Company's cash flow hedges that is expected to be reclassified to the consolidated statement of income over the next twelve months is $6,893 as of December 31, 2024.

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19. Income Taxes:

Income before income taxes within or outside the United States are shown below:

	Years ended December 31,		
	2024	2023	2022
Domestic	$ (17,186)	$ 73,774	$ 86,695
Foreign	12,164	8,165	8,040
Total	$ (5,022)	$ 81,939	$ 94,735

The provision for income taxes as shown in the accompanying consolidated statements of income consists of the following:

	Years ended December 31,		
	2024	2023	2022
Current:			
Federal	$ 6,044	$ 21,647	$ 18,210
State	2,691	3,695	3,100
Foreign	822	2,515	1,978
	9,557	27,857	23,288
Deferred:			
Federal	$ (7,053)	$ (3,644)	$ 4,544
State	(2,747)	(11,993)	(2,288)
Foreign	1,873	(1,435)	(604)
	(7,927)	(17,072)	1,652
Provision for income taxes	$ 1,630	$ 10,785	$ 24,940

A reconciliation of income tax expense at the U.S. federal statutory income tax rate to actual income tax expense is as follows:

	Years ended December 31,		
	2024	2023	2022
Tax at statutory rate	$ (1,055)	$ 17,207	$ 19,894
State income taxes, net of federal income tax benefit	183	748	248
Changes in uncertain tax positions	(9,413)	985	558
State credit - valuation allowance release	—	(10,203)	—
Rate changes	—	(101)	—
Stock compensation	427	1,803	1,876
Compensation disallowance under 162(m)	148	2,344	3,146
Foreign tax credits	(900)	(848)	—
Impairment of investment in affiliated companies	13,272	—	—
Research and development tax credits	(600)	(400)	(366)
Other, net	(432)	(750)	(416)
Provision for income taxes	$ 1,630	$ 10,785	$ 24,940

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For the year ended December 31, 2024, certain components of the rate reconciliation have been aggregated within "Other, net" in the income tax rate reconciliation table, including the tax related to the US Foreign inclusion provisions, the effect of rates different than statutory, return-to-provision tax impact and a few immaterial items, as the impact of the $65,000 impairment to the investment in affiliated companies to the Company's pre-tax book income (loss) resulted in a significantly reduced pre-tax book income (loss) for the year ended December 31, 2024.

Deferred tax assets (liabilities) are comprised of the following:

	December 31,	
	2024	2023
Deferred tax assets:		
Net operating loss carryforwards	$ 13,820	$ 14,680
Interest disallowance carryforward	2,968	1,169
Pension	288	569
Operating lease liability	8,281	5,940
Other	18,367	10,806
State credits	14,359	14,659
Foreign withholding tax credits	9,083	9,083
Total deferred tax assets, gross	67,166	56,906
Valuation allowance	(16,824)	(18,325)
Total deferred tax assets, net	50,342	38,581
Deferred tax liabilities:		
Depreciation	$ (68,361)	$ (66,816)
Inventory	(3,306)	(3,427)
Intangibles	(69,953)	(67,250)
Operating lease right-of-use assets	(8,307)	(5,954)
Other	(5,452)	(8,675)
Total deferred tax liabilities	(155,379)	(152,122)
Net deferred tax liabilities	$ (105,037)	$ (113,541)

Under the tax laws of various jurisdictions in which we operate, deductions or credits that cannot be fully utilized for tax purposes during the year may be carried forward, subject to statutory limitations, to reduce taxable income or taxes payable in a future year. As of December 31, 2024, the Company has indefinite carryforwards of $9,083 foreign withholding tax credits. The Company has recorded a full valuation allowance against the foreign withholding tax credits as it is more likely than not that the benefit from these foreign tax credits will never be realized. The Company has $14,359 of deferred tax assets related to state tax credits, which are subject to a 16-year carryforward period. The Company expects to fully utilize its state tax credits before each expiration. As of December 31, 2024, the valuation allowance associated with its state tax credits was zero. The Company has $13,820 of deferred tax assets related to state net operating losses and foreign losses, which are subject to various carryforward periods of 5 to 20 years or an indefinite carryforward period. A partial valuation allowance of $7,741 has been recorded due to the expected expiration of these state and foreign net operating losses before they are able to be utilized.

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The change in net deferred tax liabilities for the years ended December 31, 2024 and 2023 was primarily related to differences between book and tax basis depreciation, activity connected to book amortization of intangible assets with no corresponding tax basis reducing those deferred tax liabilities, activity with respect to tax deductible goodwill, activity with respect to interest rate caps recorded against other comprehensive income, activity with respect to the interest disallowance carryforward, activity with respect to the capitalization and related amortization of research and experimentation costs and activity with respect to the investment in the Zeolyst Joint Venture.

The net change in the total valuation allowance was a decrease of $1,501 in 2024. The valuation allowance at December 31, 2024 was related to state and foreign net operating loss carryforwards and foreign withholding tax credits that, in the judgment of management, are not more likely than not to be realized. In assessing the ability to realize deferred tax assets, management considered whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Management considered the scheduled reversal of deferred tax liabilities (including the impact of available carryback and carryforward periods), projected future taxable income, and tax-planning strategies that are prudent in making this assessment. In order to fully realize deferred tax assets, the Company will need to generate future taxable income prior to the expiration of the net operating loss and credit carryforwards. The amount of the deferred tax assets considered realizable, however, could be reduced in the near term if estimates of future taxable income during the carryforward period are reduced.

The cumulative unremitted earnings of foreign subsidiaries outside the United States are considered permanently reinvested, for which no withholding taxes have been provided. Such earnings are expected to be reinvested indefinitely and, as a result, no deferred tax liability has been recognized with regard to such earnings. Determination of the deferred withholding tax liability on these unremitted earnings is not practicable. Undistributed earnings of foreign subsidiaries and related companies that are deemed to be indefinitely reinvested amounted to $199,650 at December 31, 2024.

The following table summarizes the activity related to the Company's gross unrecognized tax benefits. The amounts listed in the below table also represents the total unrecognized tax benefits that, if recognized, would impact the effective tax rate as of December 31, 2024 and 2023, respectively:

	Years ended December 31,	
	2024	2023
Balance at beginning of period	$ 8,110	$ 7,787
Increases related to prior year tax positions	—	323
Uncertain tax benefit sustained due to lapsing of statue of limitations	(8,023)	—
Balance at end of period	$ 87	$ 8,110

To the extent interest and penalties are not assessed with respect to uncertain tax positions, amounts accrued will be reduced and reflected as a reduction of the overall income tax provision in the period for which the event occurs requiring the adjustment. The total amount of interest and penalties recognized in provision for income taxes on continuing operations was $1,390 and $855 for the years ended December 31, 2024 and 2023, respectively. The Company recorded cumulative accrued interest and penalties amounting to $23 as of December 31, 2024 in other long-term liabilities on its consolidated balance sheets.

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The Company files numerous consolidated and separate income tax returns in the U.S. federal jurisdiction and in many state and foreign jurisdictions. The following describes the open tax years, by significant tax jurisdiction, as of December 31, 2024:

Jurisdiction	Period
United States-Federal	2021-2024
United States-State	2020-2024

Given that the Company has utilized state net operating loss in the current and prior years, the statute for examination by the state taxing authorities will typically remain open for a period following the use of such net operating loss carryforwards, extending the period for examination beyond the years indicated above.

As of December 31, 2024, it is reasonably possible that the Company may recognize approximately $87 of previously net unrecognized tax benefits, excluding interest and penalties, related to various U.S. federal tax positions, primarily due to the expiration of statutes of limitations within the next twelve months.

As of December 31, 2024 and 2023, the Company no longer has a federal net operating loss or foreign tax credit carryforward.

Cash payments for income taxes, net of refunds, are as follows:

	Years ended December 31,		
	2024	2023	2022
Domestic	$ 22,860	$ 21,973	$ 13,277
Foreign	3,399	464	359
	$ 26,259	$ 22,437	$ 13,636

On August 16, 2022, the Inflation Reduction Act of 2022, or IRA, was signed into law. Among other things, the IRA imposes a 15% corporate alternative minimum tax for certain large corporations with average annual adjusted financial statement income in excess of $1 billion for tax years beginning after December 31, 2022, levies a 1% excise tax on net stock repurchases after December 31, 2022, and provides tax incentives to promote clean energy. Historically the Company has made discretionary share repurchases under its share repurchase programs. Beginning in 2023, these transactions will be subject to the excise tax of the IRA. See Note 7 to these consolidated financial statements for information on the accrued excise tax related to these stock repurchases.

20. Benefit Plans:

The Company sponsors two funded defined benefit pension plans that cover certain employees. Benefits for the plans are generally based on average final pay and years of service. The Company's funding policy is to fund the minimum required contributions consistent with statutory requirements based on actuarial computations utilizing the projected unit credit method of calculation.

The Company sponsors an unfunded plan to provide health care benefits to certain retired employees. The plan pays a stated percentage of medical expenses reduced by deductibles and other coverage and obligations are paid out of the Company's operations.

The Company uses a December 31 measurement date for all of its defined benefit pension and postretirement medical plans. The Company has two defined benefit pension plans: the Eco Services Hourly Pension Plan which was frozen to future accruals as of December 31, 2020 and the Eco Services Pension Equity Plan which was frozen to future accruals as of December 31, 2016. The retiree healthcare plan was closed to new retirees effective July 1, 2017.

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The following tables summarize changes in the benefit obligation, plan assets and funded status of the Company's defined benefit pension plans and other postretirement benefit plan:

	Defined Benefit Pension Plans December 31,		Other Postretirement Benefit Plan December 31,	
	2024	2023	2024	2023
Change in benefit obligation:				
Benefit obligation at beginning of period	$ 66,556	$ 66,879	$ 475	$ 446
Interest cost	3,227	3,453	24	24
Plan settlements	(1,348)	(2,543)	—	—
Benefits paid	(3,254)	(2,798)	—	(1)
Premiums paid	—	—	(3)	(3)
Actuarial (gain) loss	(3,460)	1,565	(33)	9
Benefit obligation at end of the period	61,721	66,556	463	475
Change in plan assets:				
Fair value of plan assets at beginning of period	$ 61,618	$ 60,629	$ —	$ —
Actual return on plan assets	1,048	6,330	—	—
Employer contributions	1,625	—	3	4
Plan settlements	(1,348)	(2,543)	—	—
Benefits paid	(3,254)	(2,798)	—	(1)
Premiums paid	—	—	(3)	(3)
Fair value of plan assets at end of the period	59,689	61,618	—	—
Funded status of the plans (underfunded)	$ (2,032)	$ (4,938)	$ (463)	$ (475)

Defined Benefit Pension Plans — The actuarial gain for the year ended December 31, 2024 was $3,460, which was driven by increases in the discount rates of $2,760 and improvements in general demographic experience of $700. The actuarial loss for the year ended December 31, 2023 was $1,565, which was driven by decreases in the discount rates of $1,365 and declines in general demographic experience of $200.

Other Postretirement Benefit Plan — The actuarial gain for the year ended December 31, 2024 was $33, which was driven by increases in the discount rates. The actuarial loss for the year ended December 31, 2023 was $9, which was driven by decreases in the discount rates.

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As of December 31, 2024, one of the defined benefit pension plans changed to a funded asset position, compared to an underfunded liability position in December 31, 2023. Amounts recognized in the consolidated balance sheets consist of:

	Defined Benefit Pension Plans December 31,		Other Postretirement Benefit Plan December 31,	
	2024	2023	2024	2023
Noncurrent asset	$ 90	$ —	$ —	$ —
Current liability	—	—	(20)	(18)
Noncurrent liability	(2,122)	(4,937)	(443)	(457)
AOCI, net of tax	1,386	567	81	79
Net amount recognized	$ (646)	$ (4,370)	$ (382)	$ (396)

The net amount of projected benefit obligation and plan assets for all underfunded plans was classified as noncurrent liabilities in the consolidated balance sheets.

Amounts recognized in AOCI consist of:

	Defined Benefit Pension Plans December 31,		Other Postretirement Benefit Plan December 31,	
	2024	2023	2024	2023
Prior service cost	$ —	$ —	$ —	$ 30
Net gain	1,849	751	107	75
Gross amount recognized	1,849	751	107	105
Deferred income taxes	(463)	(184)	(26)	(26)
Net amount recognized	$ 1,386	$ 567	$ 81	$ 79

Components of net periodic benefit cost consist of:

	Defined Benefit Pension Plans Years ended December 31,			Other Postretirement Benefit Plan Years ended December 31,		
	2024	2023	2022	2024	2023	2022
Interest cost	$ 3,227	$ 3,453	$ 2,569	$ 24	$ 24	$ 18
Expected return on plan assets	(3,367)	(3,305)	(3,433)	—	—	—
Amortization of prior service credit	—	—	—	(30)	(125)	(210)
Amortization of net (gain) loss	—	—	—	(2)	(2)	3
Settlement (gain) loss	(6)	61	38	—	—	—
Net periodic (benefit) expense	$ (146)	$ 209	$ (826)	$ (8)	$ (103)	$ (189)

All components of net periodic benefit cost other than service cost are presented within other expense (income), net in the Company's consolidated statements of income.

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Components of other changes in plan assets and benefit obligations recognized in other comprehensive income consists of:

	Defined Benefit Pension Plans December 31,		Other Postretirement Benefit Plan December 31,	
	2024	2023	2024	2023
Net (gain) loss	$ (1,136)	$ (1,461)	$ (33)	$ 9
Amortization of prior service credit	—	—	30	125
Amortization or settlement recognition of net gain (loss)	6	(61)	2	2
Total recognized in other comprehensive (income) loss	(1,130)	(1,522)	(1)	136
Total recognized in net periodic benefit cost and other comprehensive (income) loss	$ (1,280)	$ (1,313)	$ (9)	$ 33

The following table presents selected information about the Company's pension plans with projected benefit obligations and accumulated benefit obligations in excess of plan assets:

	Defined Benefit Pension Plans December 31,		Other Postretirement Benefit Plan December 31,	
	2024	2023	2024	2023
Projected benefit obligation	$ 18,305	$ 66,555	$ 463	$ 475
Accumulated benefit obligation	18,305	66,555	—	—
Fair value of plan assets	16,183	61,618	—	—

Significant weighted average assumptions used in determining the pension obligations include the following:

	Defined Benefit Pension Plans December 31,		Other Postretirement Benefit Plan December 31,	
	2024	2023	2024	2023
Discount rate	5.67 %	5.17 %	5.70 %	5.20 %
Rate of compensation increase	N/A	N/A	N/A	N/A

The discount rate for net periodic benefit costs is determined by utilizing a yield curve model. The model develops a spot rate curve based on the yields available from a broad-based universe of high quality corporate bonds. The discount rate is then set as the weighted average spot rate, using the respective plan's expected benefit cash flows as the weights. Significant weighted average assumptions used in determining net periodic benefit cost include the following:

	Defined Benefit Pension Plans Years ended December 31,			Other Postretirement Benefit Plan Years ended December 31,		
	2024	2023	2022	2024	2023	2022
Discount rate	5.23 %	5.39 %	2.90 %	5.20 %	5.50 %	2.90 %
Expected return on assets	5.76 %	5.74 %	4.90 %	— %	— %	— %
Rate of compensation increase	N/A	N/A	N/A	N/A	N/A	N/A

Fair value of plan assets

The investment objective for the plans is to generate returns sufficient to meet future obligations. The strategy to meet the objective includes generating attractive returns using higher returning assets such as equity securities and balancing risk using less volatile assets such as fixed income securities. The plans invest in an allocation of assets across the two broadly-defined financial asset categories of equity and fixed income securities. The target allocations for the plan assets across the two U.S. plans are as follows: 30% equity securities and 70% fixed income investments for the Eco Services Pension Equity Plan; and 20% equity securities and 80% fixed income investments for the Eco Services Hourly Pension Plan.

The Company classifies plan assets based upon a fair value hierarchy where each asset within the hierarchy is based on the lowest level input that is significant to its measurement. The fair value hierarchy consists of three levels as follows:

- Level 1—Values are unadjusted quoted prices for identical assets and liabilities in active markets accessible at the measurement date. Active markets provide pricing data for trades occurring at least weekly and include exchanges and dealer markets. Level 1 assets primarily include investments in publicly traded equity securities and mutual funds. These securities (or the underlying investments of the funds) are actively traded and valued using quoted prices for identical securities from the market exchanges.
- Level 2—Inputs include quoted prices for similar assets or liabilities in active markets, quoted prices from those willing to trade in markets that are not active, or other inputs that are observable or can be corroborated by market data for the term of the instrument. Such inputs include market interest rates and volatilities, spreads and yield curves. Level 2 assets primarily consist of fixed-income securities and commingled funds that are not actively traded or whose underlying investments are valued using observable marketplace inputs. The fair value of plan assets invested in fixed-income securities is generally determined using valuation models that use observable inputs such as interest rates, bond yields, low-volume market quotes and quoted prices for similar assets. Plan assets that are invested in commingled funds are valued using a unit price or net asset value (“NAV”) that is based on the underlying investments of the fund.
- Level 3—Certain inputs are unobservable (supported by little or no market activity) and significant to the fair value measurement. Unobservable inputs reflect the Company’s best estimate of what hypothetical market participants would use to determine a transaction price for the asset or liability at the reporting date. Level 3 assets include investments covered by insurance contracts and real estate funds valued using significant unobservable inputs.

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The following tables set forth by level, within the fair value hierarchy, plan assets at fair value:

	December 31, 2024			
	Total	Level 1	Level 2	Level 3
Cash and cash equivalents	$ —	$ —	$ —	$ —
Equity securities:				
Domestic stocks	8,248	8,248	—	—
International stocks	5,335	5,335	—	—
Fixed income securities:				
Treasury funds	11,853	11,853	—	—
Corporate and other bonds	34,253	34,253	—	—
Total	$ 59,689	$ 59,689	$ —	$ —

	December 31, 2023			
	Total	Level 1	Level 2	Level 3
Cash and cash equivalents	$ 264	$ 264	$ —	$ —
Equity securities:				
Domestic stocks	11,539	11,539	—	—
International stocks	7,546	7,546	—	—
Fixed income securities:				
Treasury funds	11,691	11,691	—	—
Corporate and other bonds	30,578	30,578	—	—
Total	$ 61,618	$ 61,618	$ —	$ —

The following benefit payments, which reflect expected future service as appropriate, are expected to be paid:

Year	*Defined Benefit Pension Plans*	*Other Postretirement Benefit Plan*
2025	$ 7,356	$ 20
2026	4,561	22
2027	4,542	23
2028	4,720	25
2029	4,552	27
2030-2034	22,539	163

The Company expects to contribute $500 to its defined benefit pension plans and $20 to the other postretirement benefit plan in 2025. There are no Medicare subsidy receipts expected in future periods.

Defined Contribution Plans

The Company has defined contribution plans covering domestic employees of the Company and a foreign subsidiary. The Company recorded expenses of $7,619, $7,015 and $7,113 related to these plans for the years ended December 31, 2024, 2023 and 2022, respectively.

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21. Stock-Based Compensation:

The Company has an equity incentive plan under which it grants common stock awards to employees, directors and affiliates of the Company. At December 31, 2024, 8,083,573 shares of common stock were available for issuance under the plan. Beginning on July 1, 2023, the Company settles these awards through the issuance of treasury shares under its equity incentive plan. The Company has granted RSAs, RSUs and PSUs as part of its equity incentive compensation program.

Stock Options

The Company has issued stock options to purchase Ecovyst Inc. common stock as part of its equity incentive compensation program. There are various vesting conditions associated with stock options issued prior to the launch of the Company's initial public offering ("IPO") in September 2017, including satisfaction of certain service and/or performance based conditions. Subsequent to the IPO, the Company's stock option grants have been subject to graded vesting conditions based on service. The maximum contractual term of the Company's stock options is ten years.

The following table summarizes the activity of common stock options for the period from December 31, 2021 through the year ended December 31, 2024:

	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding at December 31, 2021	1,884,351	$ 6.99	[1]	
Exercised	(199,970)	$ 3.06		
Forfeited	(51,860)	$ 3.98		
Expired	(111,524)	$ 11.97		
Outstanding at December 31, 2022	1,520,997	$ 7.24		
Exercised	(197,941)	$ 2.58		
Forfeited	(284,956)	$ 3.39		
Expired	(328,677)	$ 12.36		
Outstanding at December 31, 2023	709,423	$ 7.73		
Exercised	(93,962)	$ 3.04		
Outstanding at December 31, 2024	615,461	$ 8.44	2.26	$ 1,054
Exercisable at December 31, 2024	615,461	$ 8.44	2.26	$ 1,054

[1] On August 4, 2021, the Company's Board of Directors declared a special cash dividend of $3.20 per share to the stockholders of record as of the close of business on August 12, 2021, using the after tax cash proceeds from the sale of the Performance Chemicals business. This reflects the impact of the reduction in the strike price on all outstanding vested and unvested stock options by $3.20 per share.

The aggregate intrinsic value per the above table represents the difference between the fair value the Company's common stock on the last trading day of the reporting period (determined in accordance with the plan terms) and the exercise price of in-the-money stock options multiplied by the respective number of stock options as of that date. The total intrinsic value of stock options exercised were $472, $1,693 and $1,306 during the years ended December 31, 2024, 2023 and 2022 respectively. Additionally, cash proceeds received by the Company from the exercise of stock options were not material for the years ended December 31, 2024, 2023 and 2022 respectively.

There were no stock option awards granted during the years ended December 31, 2024, 2023 and 2022. The Company uses the Black-Scholes option pricing model to determine the fair value of its stock option grants.

Restricted Stock Awards, Restricted Stock Units and Performance Stock Units

RSA

The Company has granted RSAs subject to vesting conditions based on (1) service only, (2) performance only or (3) a combination of service and performance conditions, dependent on which event occurs first. The vesting requirements for the majority of these awards were based upon the achievement of a performance condition. As defined in the award agreements, each award subject to the performance condition fully vests upon the occurrence of a defined liquidity event upon which certain investment funds affiliated with CCMP, a former stockholder, receive proceeds exceeding certain thresholds. Although achievement of the performance condition is subject to continued service with the Company, the terms of awards issued with performance conditions stipulate that the performance vesting condition can be attained for a period of six months following separation from service under certain circumstances, depending on the means of separation from the Company and subject to other factors such as individual separation agreements. The same performance vesting condition for the Company's RSAs also governs the achievement of the performance vesting condition for the Company's stock options.

During the year ended December 31, 2024, the Company granted 4,540 of RSAs with a weighted average grant date fair value of $8.81 per share that immediately vested. As of December 31, 2024, the Company did not have any outstanding unvested RSAs subject to performance vesting condition.

RSU

During the year ended December 31, 2024, the Company granted 1,126,166 RSUs under its equity incentive plan. Each RSU provides the recipient with the right to receive a share of common stock subject to graded vesting terms based on service, which for the awards granted during the year ended December 31, 2024, generally requires approximately one year of service for members of the Company's board of directors and approximately three years of service for employees. The value of the RSUs granted during the year ended December 31, 2024 was based on the average of the high and low trading prices of the Company's common stock on the NYSE on the preceding trading day, in accordance with the Company's policy for valuing such awards. Compensation expense related to the RSUs is recognized on a straight-line basis over the respective vesting period.

PSU

2024 Grants

During the year ended December 31, 2024, the Company granted 535,629 PSUs (at target) under its equity incentive plan. The PSUs granted during the year ended December 31, 2024 provide the recipients with the right to receive shares of common stock dependent on 50% of a Company-specific financial performance target and 50% on the relative increase in the total shareholder return ("TSR") goal ("the Performance measures"). The Performance measures are measured independently of each other, but achievement of both metrics is measured on the same three-year performance period from January 1, 2024 through December 31, 2026 ("Performance period"). Depending on the Company's performance relative to the Performance measures, each PSU award recipient is eligible to receive a percentage of the target number of shares granted to the recipient, ranging from 0% to 200%. The PSUs, to the extent earned, will vest on the date the Compensation Committee of the Company's Board of Directors ("Compensation Committee") certifies the achievement of the Performance measures for the Performance period, which will occur subsequent to the end of the Performance period and after the Company files its annual consolidated financial statements for the year ending December 31, 2026.

Achievement of the Company-specific financial performance target is measured based on the actual three-year cumulative results across the Performance period. The TSR goal is based on the Company's actual TSR performance against companies in the S&P 1500 Specialty Chemicals Index over the Performance period. The TSR goal, which determines how much of the 50% of the PSUs granted during 2024 may be earned, is considered a market condition as opposed to a vesting condition. Because a market condition is not considered a vesting condition, it is reflected in the grant date fair value of the award and the associated compensation cost based on the fair value of the award is recognized over the Performance period, regardless of whether the Company actually achieves the market condition or the level of achievement, as long as service is provided by the recipient.

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2023 Grants

During the year ended December 31, 2023, the Company granted 721,537 PSUs (at target) under its equity incentive plan. The PSUs granted during the year ended December 31, 2023 provide the recipients with the right to receive shares of common stock dependent on the achievement of a TSR goal, and are generally subject to the provision of service through the vesting date of the award. The performance period for the TSR goal is measured based on a three-year performance period from January 1, 2023 through December 31, 2025. The TSR goal is based on the Company's actual TSR percentage increase over the performance period. Depending on the Company's performance relative to the TSR goal, each PSU award recipient is eligible to receive a percentage of the target number of shares granted to the recipient, ranging from zero to 200%. The PSUs, to the extent earned, will vest on the date the Compensation Committee certifies the achievement of the performance metric for the three-year period ending December 31, 2025, which will occur subsequent to the end of the performance period and after the Company files its annual consolidated financial statements for the year ending December 31, 2025.

2022 Grants

During the year ended December 31, 2022, the Company granted 295,132 PSUs (at target) under its equity incentive plan. The PSUs granted during the year ended December 31, 2022 provide the recipients with the right to receive shares of common stock dependent on the achievement of a TSR goal, and are generally subject to the provision of service through the vesting date of the award. The performance period for the TSR goal is measured based on a three-year performance period from January 1, 2022 through December 31, 2024. The TSR goal is based on the Company's actual TSR percentage increase over the performance period. Depending on the Company's performance relative to the TSR goal, each PSU award recipient is eligible to receive a percentage of the target number of shares granted to the recipient, ranging from zero to 200%. The PSUs, to the extent earned, will vest on the date the Compensation Committee certifies the achievement of the performance metric for the three-year period ending December 31, 2024, which will occur subsequent to the end of the performance period and after the Company files its annual consolidated financial statements for the year ending December 31, 2024.

2021 Grants

In February 2024, the Compensation Committee certified the achievement of the performance metrics for the three-year period ended December 31, 2023, related to the PSUs granted during the year ended December 31, 2021. The PSUs granted during the year ended December 31, 2021 provide the recipients with the right to receive shares of common stock dependent on the achievement of a TSR goal, and are generally subject to the provision of service through the vesting date of the award. The TSR goal was based on the Company's actual TSR percentage increase over the performance period. The awards vested during the year ended December 31, 2024 with no percentage of the TSR goal earned.

Weighted Average Assumptions

The following table shows the weighted average assumptions for each of the unvested grants:

	2024 Grants	2023 Grants	2022 Grants
Weighted average fair value based on Monte Carlo simulation[1]	$ 11.64	$ 12.27	$ 8.82
Expected dividend yield	— %	— %	— %
Risk-free interest rate	4.09 %	3.80 %	1.51 %
Expected volatility	39.45 %	48.82 %	44.51 %
Expected term (in years)	2.95	2.96	2.91

(1) Relative to the TSR performance measure only.

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Award Activity

The following table summarizes the activity of restricted stock awards, restricted stock units and performance stock units for the period from December 31, 2021 through the year ended December 31, 2024:

	Restricted Stock Awards		Restricted Stock Units		Performance Stock Units	
	Number of Shares	Weighted Average Grant Date Fair Value (per share)	Number of Units	Weighted Average Grant Date Fair Value (per share)	Number of Units	Weighted Average Grant Date Fair Value (per share)
Nonvested as of December 31, 2021	633,724	$ 15.84 [1]	2,507,421	$ 15.68	1,117,555 [1]	$ 16.91
Granted	—	$ —	2,779,690	$ 10.28	295,132	$ 8.82
Vested	(84,903)	$ 8.83	(1,550,969)	$ 15.08	(496,442)	$ 15.41
Forfeited	(271,765)	$ 15.84	(1,271,424)	$ 12.27	(276,713)	$ 12.33
Nonvested as of December 31, 2022	277,056	$ 15.66	2,464,718	$ 11.73	639,532 [1]	$ 16.32
Granted	5,081	$ 9.84	1,195,835	$ 9.84	721,537	$ 12.28
Vested	(5,081)	$ 9.84	(1,436,301)	$ 11.84	(200,204)	$ 20.16
Forfeited	(277,056)	$ 15.66	(261,424)	$ 11.27	(201,648)	$ 18.57
Nonvested as of December 31, 2023	—	$ —	1,962,828	$ 10.55	959,217 [1]	$ 11.84
Granted	4,540	$ 8.81	1,126,166	$ 8.84	535,629	$ 10.23
Vested	(4,540)	$ 8.81	(1,000,288)	$ 11.10	—	$ —
Forfeited	—	$ —	(111,333)	$ 9.27	(141,437)	$ 12.82
Nonvested as of December 31, 2024	—	$ —	1,977,373	$ 9.37	1,353,409 [1]	$ 11.10

(1) Based on target.

Cash proceeds received by the Company from the exercise of stock options were not material for the year ended December 31, 2024.

The total fair value of RSAs that vested during the years ended December 31, 2024, 2023 and 2022 was $40, $50 and $749, respectively.

The total fair value of RSUs that vested during the years ended December 31, 2024, 2023 and 2022 was $11,102, $17,008 and $15,579, respectively.

The total fair value of PSUs that vested during the years ended December 31, 2024, 2023 and 2022 was $0, $4,035 and $5,277, respectively.

Prior to the Company's IPO, the Company issued restricted stock awards and stock options with performance conditions that were based on the occurrence of a defined liquidity event upon which certain investment funds affiliated with CCMP receive proceeds exceeding defined thresholds. In addition to the defined liquidity event, subsequent to the Company's IPO, the performance vesting condition can also be achieved if the average closing trading price of the Company's common stock on the NYSE over any consecutive ten-day trading period equals or exceeds a price that would be equivalent to the achievement of the threshold proceeds to CCMP. When a liquidity event occurred on March 7, 2023, the investment funds affiliated with CCMP received proceeds that did not exceed the defined thresholds. As a result, all of the Company's RSAs and stock options subject to the performance condition were forfeited and cancelled.

See Note 22 to these consolidated financial statements for further information on the number of RSAs and stock options outstanding subject to performance-based vesting.

Stock-Based Compensation Expense

For the years ended December 31, 2024, 2023 and 2022, total stock-based compensation expense for the Company was $14,043, $16,031 and $20,632, respectively. The associated income tax benefit recognized in the consolidated statements of income for the years ended December 31, 2024, 2023 and 2022 was $3,091, $1,826 and $2,799, respectively.

As of December 31, 2024, there was no unrecognized compensation cost related to nonvested restricted stock awards subject to service vesting conditions. As of December 31, 2024, unrecognized compensation cost was $8,697 for restricted stock units and $5,320 for performance stock units. The weighted-average period over which these costs are expected to be recognized at December 31, 2024 is 1.64 years for the restricted stock units and 1.55 years for the performance stock units. No expense has been recognized for any stock options subject to the performance condition for the years ended December 31, 2024, 2023 and 2022, and no expense has been recognized for any restricted stock awards subject to the performance condition for the years ended December 31, 2024 and 2023, as the performance-based criteria was not achieved nor considered probable of achievement.

22. Earnings per Share:

Basic earnings per share is calculated as income available to common stockholders, divided by the weighted average number of common shares outstanding during the period. The weighted average number of common shares outstanding during the period for the computation of basic earnings per share excludes RSAs that have legally been issued but are nonvested during the period, as the sale of these shares is prohibited pending satisfaction of certain vesting conditions by the award recipients in order to earn the rights to the shares (see Note 21 to these consolidated financial statements for further information regarding outstanding nonvested restricted stock awards).

Diluted earnings per share is calculated as income available to common stockholders, divided by the weighted average number of common and potential common shares outstanding during the period, if dilutive. Potential common shares reflect (1) unvested RSAs and RSUs with service vesting conditions, (2) PSUs with vesting conditions considered probable of achievement and (3) options to purchase common stock, all of which have been included in the diluted earnings per share calculation using the treasury stock method.

The reconciliation from basic to diluted weighted average shares outstanding is as follows:

	Years ended December 31,		
	2024	2023	2022
Weighted average shares outstanding – Basic	116,719,437	118,367,214	133,601,322
Dilutive effect of unvested common shares and RSUs with service conditions, PSUs considered probable of vesting and assumed stock option exercises and conversions	—	1,120,495	1,486,850
Weighted average shares outstanding – Diluted	116,719,437	119,487,709	135,088,172

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The Company reported a net loss for the year ended December 31, 2024, therefore excluded 728,001 of dilutive effect of unvested common shares, RSUs with service conditions, PSUs considered probably of vesting and assumed stock option exercises and conversions from the computation of weighted average diluted shares outstanding.

Basic and diluted income per share are calculated as follows:

	Years ended December 31,		
	2024	2023	2022
Numerator:			
(Loss) income from continuing operations attributable to Ecovyst Inc.	$ (6,652)	$ 71,154	$ 69,795
Income from discontinued operations attributable to Ecovyst Inc.	—	—	3,902
Net (loss) income attributable to Ecovyst Inc.	$ (6,652)	$ 71,154	$ 73,697
Denominator:			
Weighted average shares outstanding – Basic	116,719,437	118,367,214	133,601,322
Weighted average shares outstanding – Diluted	116,719,437	119,487,709	135,088,172
Net (loss) income per share:			
Basic (loss) income per share - continuing operations	$ (0.06)	$ 0.60	$ 0.52
Diluted (loss) income per share - continuing operations	$ (0.06)	$ 0.60	$ 0.52
Basic income per share - discontinued operations	$ —	$ —	$ 0.03
Diluted income per share - discontinued operations	$ —	$ —	$ 0.03
Basic (loss) income per share	$ (0.06)	$ 0.60	$ 0.55
Diluted (loss) income per share	$ (0.06)	$ 0.60	$ 0.55

The table below presents additional details of the Company's weighted average equity-based awards outstanding during each respective year that were excluded from the calculation of diluted earnings per share:

	Years ended December 31,		
	2024	2023	2022
RSAs with performance only targets not yet achieved	—	—	539,688
Stock options with performance only targets not yet achieved	—	51,526	309,984
Anti-dilutive RSUs and PSUs	387,078	286,729	20,497
Anti-dilutive stock options	367,100	508,623	776,594

RSAs and stock options with performance only vesting conditions were not included in the dilution calculation, as the performance targets have not been achieved nor were probable of achievement as of the end of the respective periods. These awards and stock options were canceled on March 7, 2023 (see Note 21 to these consolidated financial statements for additional information). Certain stock options to purchase shares of common stock were excluded from the computation of diluted earnings per share for the respective periods because the options' exercise price was greater than the average market price of the common shares. These stock options and anti-dilutive awards are not included in the dilution calculation, as their inclusion would have the effect of increasing diluted income per share or reducing diluted loss per share.

23. Commitments and Contingent Liabilities:

Environmental Contingencies

There is a risk of environmental impact in the Company's manufacturing operations. The Company's environmental policies and practices are designed to comply with existing laws and regulations and to minimize the possibility of significant environmental impact. The Company is also subject to various other lawsuits and claims with respect to matters such as governmental regulations, labor and other actions arising out of the normal course of business. All claims that are probable and reasonably estimable have been accrued for in the Company's consolidated financial statements. When these matters are ultimately concluded and determined, the Company believes that there will be no material adverse effect on its consolidated financial position, results of operations or liquidity.

The Company has recorded a reserve of $530 and $313 as of December 31, 2024 and 2023, respectively, to address remaining subsurface remedial and wetlands/marsh management activities at the Company's Martinez, California site. Although currently a sulfuric acid regeneration plant, the site was originally operated by Mountain Copper Company ("Mococo") as a copper smelter. Also, the site sold iron pyrite to various customers and allowed their customers to deposit waste iron pyrite cinder and slag on the site. The property is adjacent to the now capped former Peyton Slough, where Mococo had a permitted discharge point from its process and the current Peyton Slough. In 1997, the San Francisco Bay Regional Water Quality Control Board ("RWQCB") required characterization and remediation of former Peyton Slough for Copper, Zinc and Acidic Soils. Various remediation activities were undertaken and completed, including the excavation of a new Peyton Slough, which is the current site. The site received final concurrence from the Army Corps with respect to the completed work. The RWQCB agreed that Ecoservices has achieved the goals for vegetative cover. The current marsh condition is being sustained by the opening and subsequent closing of the tide gates on a periodic basis. Through facilitation between the Company, the RWQCB and various other governmental and private stakeholders, an alliance was formed and recently culminated in an independent environmental-related settlement agreement between the RWQCB and a company not associated with the facilitation efforts. Under the settlement agreement, another company agreed to fund a Supplemental Environmental Project for the Peyton Slough Marshes Water Quality Improvements and Management Project (Peyton Slough SEP). The Peyton Slough SEP will be managed by the Contra Costa Resource Conservation District and is intended to improve water circulation and water quality within the marshes adjacent to Carquinez Strait, including the Peyton Slough Channel and McNabney Marsh, by automating tide gate operations to improve exchange between Peyton Slough and Carquinez Strait. The project will also assess sediment quality and distribution within the system to evaluate methods of further enhancing water quality and marsh habitat. In addition, the Company is currently in the process of negotiating modified permits with various governmental agencies, including the RWQCB for the long-term maintenance of the capped Peyton Slough and the associated levees and berms.

As of December 31, 2024 and 2023, the Company has recorded a reserve of $216 and $121, respectively, for subsurface remediation, including the Soil Vapor Extraction Project, at the Company's Dominguez, California site. In the 1980s and 1990s, the EPA and the Los Angeles Regional Water Quality Control Board conducted investigations of the site due to historic chlorinated pesticide and chlorinated solvent use. Soil and groundwater beneath the site were impacted by chlorinated solvents and associated breakdown products, petroleum hydrocarbons, chlorinated pesticides and metals. A Corrective Measures Plan approved in October 2011 requires (1) soil vapor extraction ("SVE") in affected areas, (2) covering of unpaved areas containing pesticide impacted soil, and (3) annual groundwater monitoring of the perched water-bearing zone. Annual groundwater sampling and soil vapor monitoring indicates that the SVE system has been effective in reducing subsurface contaminant levels. The Company is moving in the direction of rendering the SVE system dormant and potentially closing this matter within the next few years following rebound testing, including the preparation of soil vapor and groundwater cleanup goals as requested by the California Department of Toxic Substances Control. Annual inspection of the now covered areas containing pesticide impacted soil and repairs, as warranted, are expected to continue.

As of December 31, 2024, the Company recorded a reserve of $37 for the ongoing groundwater monitoring efforts associated with the Company's Hammond, Indiana site. Numerous environmental-related investigations have been conducted at the site, including, but not limited to, under a Voluntary Corrective Action Agreement ("VCAA") executed by one of the Company's predecessors (Rhodia Inc.) with the Indiana Department of Environmental Management ("IDEM") on April 28, 2010 and most recently in accordance with an 2018 Corrective Measures Proposal ("CMP"). Groundwater monitoring has been conducted at the site since 2011 to address chlorinated volatile organic compound ("CVOC") impacts from a former railcar unloading area in the northern portion of the site. The Company only uses this area for loading virgin acid and unloading spent acid. The CMP established monitored natural attenuation ("MNA") as the corrective measure for addressing CVOCs present in groundwater in the northern portion of the site and offsite beneath the adjacent Northern Indiana Commuter Transportation District ("NICTD") property and a gas station; and has been and continues to be implemented since 2018. In light of increasing CVOC concentrations in one deep perimeter well, the criteria for ceasing monitoring under the CMP has not yet been achieved. The Company plans to meet with IDEM to discuss potential options for closing out this matter.

Letters of Credit

At December 31, 2024, the Company had outstanding letters of credit of $3,330. Letters of credit are guarantees of payment to third parties. The Company's letters of credit are used primarily as collateral for various items, including energy and insurance payments. The letters of credit are supported by the Company's ABL facility.

24. Related Party Transactions:

The Company maintains certain policies and procedures for the review, approval and ratification of related party transactions to ensure that all transactions with selected parties are fair, reasonable and in the Company's best interests. All significant relationships and transactions are separately identified by management if they meet the definition of a related party or a related party transaction. Related party transactions include transactions that occurred during the year, or are currently proposed, in which the Company was or will be a participant, and for which any related person had or will have a direct or indirect material interest. All related party transactions are reviewed, approved and documented by the appropriate level of the Company's management in accordance with these policies and procedures.

Joint Venture Agreement

The Company entered into a joint venture agreement (the "ZI Partnership Agreement") in 1988 with Shell Catalysts & Technologies, an affiliate of Royal Dutch Shell plc, to form Zeolyst International, a 50/50 joint venture partnership (the "Partnership"). Under the terms of the ZI Partnership Agreement, the Partnership leases certain land used in its Kansas City production facilities from Ecovyst. This lease, which has been recorded as an operating lease and terms are evergreen as long as the ZI Partnership Agreement is in place, provided for rental payments to the Company of $310 during the years ended December 31, 2024, 2023 and 2022, respectively. These rental payments were included in cost of goods sold in the consolidated statements of income. The Partnership had no sales to the Company for the years ended December 31, 2024 and 2022, respectively, and sales of $236 to the Company for the year ended December 31, 2023.

The Partnership purchases certain raw materials from the Company and was charged for various manufacturing costs incurred at the Company's Kansas City production facility. The amount of these costs charged to the Partnership were $17,315, $20,594 and $23,699 for the years ended December 31, 2024, 2023 and 2022, respectively and were included in cost of goods sold in the consolidated statements of income. In addition, the Partnership was charged certain product demonstration costs of $1,029, $1,819 and $1,621 during the years ended December 31, 2024, 2023 and 2022, respectively, which were also included in cost of goods sold in the consolidated statements of income.

Certain administrative, marketing, engineering, management-related and research and development services are provided to the Partnership by the Company. The Partnership was charged $17,203, $14,758 and $13,908 for the years ended December 31, 2024, 2023 and 2022, respectively and were included in selling, general and administrative expenses in the consolidated statements of income.

The Company had an accounts receivable from the Partnership of $2,794 and $3,164 as of December 31, 2024 and 2023, respectively, which were included in prepaid and other current assets in the consolidated balance sheet. There were no accounts payable with the Partnership as of December 31, 2024 and 2023, respectively.

ECOVYST INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except share and per share amounts)

25. Supplemental Cash Flow Information:

The following table presents supplemental cash flow information for the Company:

	Years ended December 31,		
	2024	2023	2022
Cash paid during the year for:			
Income taxes, net of refunds	$ 26,259	$ 22,437	$ 25,556
Interest[1]	48,972	42,081	35,370
Non-cash investing activity:			
Capital expenditures acquired on account but unpaid as of the year end	4,882	3,427	4,653
Non-cash financing activities[2]:			
Accrued excise tax on share repurchases (Note 7)	—	638	—

(1) Cash paid for interest is shown net of capitalized interest and includes the cash received or paid on the Company's interest rate cap agreements designated as cash flow hedges for the periods presented (see Note 18 to these consolidated financial statements for details).

(2) For the supplemental non-cash information on lease liabilities arising from obtaining right-of-use lease assets, see Note 12 to these consolidated financial statements for further information.

26. Subsequent Events:

In January 2025, the Company re-priced the 2024 Term Loan Facility to reduce the applicable interest rate. The terms of the facility were substantially consistent following the re-pricing, except that borrowings under the term loan will bear interest at a rate equal to term SOFR plus 2.00% per annum. See Note 16 to these consolidated financial statements for further information on the transaction.

Other than this item, the Company has evaluated subsequent events since the balance sheet date and determined that there are no additional items to disclose.

SCHEDULE I
ECOVYST INC. AND SUBSIDIARIES (PARENT)
CONDENSED FINANCIAL INFORMATION
CONDENSED STATEMENTS OF (LOSS) INCOME
(in thousands)

	Years ended December 31,		
	2024	2023	2022
Stock compensation expense	$ 14,043	$ 16,031	$ 20,632
Equity in net (income) from subsidiaries	(7,391)	(87,185)	(94,329)
Net (loss) income	(6,652)	71,154	73,697
Other comprehensive income (loss), net of tax:			
Pension and postretirement benefits	855	1,120	(2,676)
Net (loss) gain from hedging activities	(2,644)	(12,126)	24,382
Foreign currency translation	(4,660)	4,056	(9,922)
Total other comprehensive (loss) income	(6,449)	(6,950)	11,784
Comprehensive (loss) income	$ (13,101)	$ 64,204	$ 85,481

See accompanying notes to condensed financial statements.

SCHEDULE I
ECOVYST INC. AND SUBSIDIARIES (PARENT)
CONDENSED FINANCIAL INFORMATION
CONDENSED BALANCE SHEETS
(in thousands, except share and per share amounts)

	December 31,	
	2024	2023
ASSETS		
Investment in subsidiaries	$ 700,460	$ 705,464
Total assets	$ 700,460	$ 705,464
LIABILITIES		
Total liabilities	$ —	$ —
STOCKHOLDERS' EQUITY		
Common stock (0.01 par); authorized shares 450,000,000; issued shares 140,872,846 and 140,744,045 on December 31, 2024 and 2023, respectively; outstanding shares 116,534,803 and 116,116,895 on December 31, 2024 and 2023, respectively	1,409	1,407
Preferred stock (0.01 par); authorized shares 50,000,000; no shares issued or outstanding on December 31, 2024 and 2023, respectively	—	—
Additional paid-in capital	1,106,792	1,102,581
Accumulated deficit	(177,508)	(170,856)
Treasury stock, at cost; shares 24,338,043 and 24,627,150 on December 31, 2024 and 2023, respectively	(222,826)	(226,710)
Accumulated other comprehensive loss	(7,407)	(958)
Total equity	700,460	705,464
Total liabilities and equity	$ 700,460	$ 705,464

See accompanying notes to condensed financial statements.

SCHEDULE I
ECOVYST INC. AND SUBSIDIARIES (PARENT)
CONDENSED FINANCIAL INFORMATION
CONDENSED STATEMENTS OF CASH FLOWS
(in thousands)

	Years ended December 31,		
	2024	2023	2022
Cash flows from operating activities:			
Net (loss) income	$ (6,652)	$ 71,154	$ 73,697
Adjustments to reconcile net (loss) income to net cash provided by operating activities:			
Equity in net (income) from subsidiaries	(7,391)	(87,185)	(94,329)
Stock compensation expense	14,043	16,031	20,632
Net cash provided by operating activities	—	—	—
Effect of exchange rate changes on cash and cash equivalents	—	—	—
Net change in cash and cash equivalents	—	—	—
Cash and cash equivalents at beginning of period	—	—	—
Cash and cash equivalents at end of period	$ —	$ —	$ —

See accompanying notes to condensed financial statements.

SCHEDULE I
ECOVYST INC. AND SUBSIDIARIES (PARENT)
CONDENSED FINANCIAL INFORMATION
NOTES TO CONDENSED SCHEDULE I

1. Description of Ecovyst Inc. and Subsidiaries

Ecovyst Inc. ("Ecovyst" or the "Parent Company") is a holding company that conducts substantially all of its business operations through its wholly owned subsidiary, Ecovyst Catalyst Technologies LLC. As specified in certain of Ecovyst Catalyst Technologies LLC's debt agreements, there are restrictions on the ability of Ecovyst Catalyst Technologies LLC to make payments to its stockholder, Ecovyst, on behalf of its equity interests (refer to Note 16 to the Ecovyst consolidated financial statements for further information regarding Ecovyst debt).

2. Basis of Presentation

The accompanying condensed Parent Company financial statements are required in accordance with Rule 4-08(e)(3) of Regulation S-X. These condensed financial statements have been presented on a "parent-only" basis and are not the general-purpose financial statements of Ecovyst. Under a parent-only presentation, the Parent Company's investment in its consolidated subsidiary is recorded based upon its proportionate share of the subsidiary's net assets, similar to presenting it under the equity method of accounting. Under the equity method, the investment in subsidiary is stated at cost plus contributions and equity in undistributed income (loss) of the subsidiary, less distributions received since the date of acquisition. These parent-only financial statements should be read in conjunction with Ecovyst's audited consolidated financial statements and the accompanying notes thereto.

3. Stock-Based Compensation

Refer to Note 21 of the notes to the Ecovyst consolidated financial statements for a description of stock-based compensation.

Report of Independent Auditors

To the Management Committee of Zeolyst International

Opinion

We have audited the accompanying financial statements of Zeolyst International (the "Partnership"), which comprise the balance sheets as of December 31, 2024 and 2023, and the related statements of operations and accumulated earnings, of changes in partners' capital and of cash flows for the three years in the period ended December 31, 2024, including the related notes (collectively referred to as the "financial statements").

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Partnership as of December 31, 2024 and 2023, and the results of its operations and its cash flows for the three years in the period ended December 31, 2024 in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (US GAAS). Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the Partnership and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Emphasis Of Matter

As discussed within Footnote 15 to the financial statements, the Partnership has significant related party transactions. Our opinion is not modified with respect to this matter.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Partnership's ability to continue as a going concern for one year after the date the financial statements are available to be issued.

Auditors' Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with US GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with US GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Partnership's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Partnership's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

/s/ PricewaterhouseCoopers LLP
Philadelphia, Pennsylvania
February 28, 2025

ZEOLYST INTERNATIONAL
STATEMENTS OF OPERATIONS AND ACCUMULATED EARNINGS
(in thousands)

	Years ended December 31,		
	2024	**2023**	**2022**
Sales	$ 233,079	$ 312,963	$ 265,060
Cost of goods sold	157,139	206,583	151,852
Gross profit	75,940	106,380	113,208
Selling, general and administrative expenses (SG&A)	40,176	37,203	38,462
Other operating (income) expense, net	540	(217)	(31)
Operating income	35,224	69,394	74,777
Interest expense (income), net	(705)	(453)	270
Other expense (income), net	2,557	(497)	510
Net income	33,372	70,344	73,997
Accumulated earnings at beginning of year	277,007	262,663	258,666
Dividends paid	(76,000)	(56,000)	(70,000)
Accumulated earnings at end of year	$ 234,379	$ 277,007	$ 262,663

See accompanying notes to financial statements.

ZEOLYST INTERNATIONAL
BALANCE SHEETS
(in thousands)

	December 31, 2024	December 31, 2023
ASSETS		
Cash	$ 35,267	$ 8,417
Trade receivables, net:		
Receivables from third parties	41,217	70,562
Receivables from affiliates	3,666	43,260
Inventories	123,428	117,326
Other current assets	1,942	1,783
Total current assets	205,520	241,348
Property, plant and equipment, net	96,015	105,211
Intangible assets	2,850	3,900
Right-of-use lease asset	5,581	5,708
Other long-term assets	9,529	7,083
Total assets	$ 319,495	$ 363,250
LIABILITIES		
Trade accounts payable	$ 9,996	$ 9,349
Accounts payable to affiliates	13,336	12,178
Operating lease liability—current	131	109
Accrued liabilities	1,273	4,078
Total current liabilities	24,736	25,714
Operating lease liability—noncurrent	5,450	5,599
Revolver	—	—
Total liabilities	30,186	31,313
Commitments and contingencies (Note 14)		
PARTNERS' CAPITAL		
Contributed capital	54,930	54,930
Accumulated earnings	234,379	277,007
Net partners' capital	289,309	331,937
Total liabilities and partners' capital	$ 319,495	$ 363,250

See accompanying notes to financial statements.

ZEOLYST INTERNATIONAL
STATEMENTS OF CHANGES IN PARTNERS' CAPITAL
(in thousands)

	Contributed capital	Accumulated earnings	Net partners' capital
Ecovyst Inc.:			
Balance, December 31, 2021	$ 27,465	$ 129,333	$ 156,798
Dividends paid		(35,000)	(35,000)
Net income		36,999	36,999
Balance, December 31, 2022	$ 27,465	$ 131,332	$ 158,797
Dividends paid		(28,000)	(28,000)
Net income		35,172	35,172
Balance, December 31, 2023	$ 27,465	$ 138,504	$ 165,969
Dividends paid		(38,000)	(38,000)
Net income		16,686	16,686
Balance, December 31, 2024	$ 27,465	$ 117,190	$ 144,655
Shell Catalysts & Technologies:			
Balance, December 31, 2021	$ 27,465	$ 129,333	$ 156,798
Dividends paid		(35,000)	(35,000)
Net income		36,999	36,999
Balance, December 31, 2022	$ 27,465	$ 131,332	$ 158,797
Dividends paid		(28,000)	(28,000)
Net income		35,172	35,172
Balance, December 31, 2023	$ 27,465	$ 138,504	$ 165,969
Dividends paid		(38,000)	(38,000)
Net income		16,686	16,686
Balance, December 31, 2024	$ 27,465	$ 117,190	$ 144,655
Total partners' capital at December 31, 2022	$ 54,930	$ 262,663	$ 317,593
Total partners' capital at December 31, 2023	$ 54,930	$ 277,007	$ 331,937
Total partners' capital at December 31, 2024	$ 54,930	$ 234,379	$ 289,309

See accompanying notes to financial statements.

ZEOLYST INTERNATIONAL
STATEMENTS OF CASH FLOWS
(in thousands)

	Years ended December 31,		
	2024	**2023**	**2022**
Cash flows from operating activities:			
Net income	$ 33,372	$ 70,344	$ 73,997
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	15,937	16,282	20,393
Loss on sale or disposal of capital assets	21	79	37
Amortization of deferred financing fees	33	33	51
Net change in returns allowance	135	—	37
Net change in inventory reserve	(1,520)	1,319	300
Other	(2,562)	(3,597)	(3,326)
Working capital changes that provided (used) cash:			
Receivables, including affiliates	68,804	(25,010)	(15,675)
Inventories	(4,582)	15,292	(27,410)
Other current assets	(192)	90	(747)
Accounts payable, including affiliates	1,443	(1,352)	(6,207)
Other current liabilities	(2,783)	(198)	(2,571)
Net cash provided by operating activities	108,106	73,282	38,879
Cash flows from investing activities:			
Purchases of property, plant and equipment	(5,256)	(4,273)	(3,122)
Net cash used in investing activities	(5,256)	(4,273)	(3,122)
Cash flows from financing activities:			
Draw down of revolver	5,000	20,000	46,000
Payments on revolver	(5,000)	(30,000)	(36,000)
Payments of cash dividends	(76,000)	(56,000)	(70,000)
Net cash used in financing activities	(76,000)	(66,000)	(60,000)
Net change in cash	26,850	3,009	(24,243)
Cash at beginning of period	8,417	5,408	29,651
Cash at end of period	$ 35,267	$ 8,417	$ 5,408
Non-cash investing activity:			
Capital expenditures acquired on account but unpaid	$ 1,880	$ 1,518	$ 1,066

See accompanying notes to financial statements.

ZEOLYST INTERNATIONAL
NOTES TO FINANCIAL STATEMENTS
(in thousands)

1. Organization:

Zeolyst International is a Kansas general partnership ("Partnership") by and between Ecovyst Catalyst Technologies LLC ("Ecovyst") and Shell Catalysts & Technologies (formerly referred to as CRI Zeolites Inc. ("CRI")), a Royal Dutch Shell affiliate (collectively, the "Partners") formed pursuant to a Partnership Agreement dated February 1, 1988, as amended ("the Agreement"). Pursuant to a Contribution, Assignment, and Assumption Agreement dated July 29, 2021 (the "Contribution Agreement") by and between Ecovyst and PQ Corporation ("PQ"), PQ transferred and Ecovyst assumed PQ's interest in the Partnership and the Agreement.

The percentage interests as of December 31, 2024 and 2023 are as follows:

Ecovyst	50%
Shell Catalysts & Technologies	50%

The Partnership was formed pursuant to the Kansas Uniform Partnership Act. The Agreement specifies that the partners share equally in capital contributions. The Agreement states that the profits and losses of the Partnership will be allocated in accordance with the partners' interests in the Partnership. The intent of the Partnership is to develop, manufacture, and sell zeolites and zeolite-containing catalysts.

The Partnership has significant transactions with its partners and related affiliates. See Note 15 for further information on related party transactions.

2. Partnership Business:

The Partnership manufactures zeolites and zeolytic catalysts that are used by refiners to capture impurities in the processing of petroleum based feed streams while increasing value. The selectivity and activity of zeolites used for this purpose can improve yields and have a general life cycle of 3-4 years. As a result, a significant portion of the Partnership's customer base tends to change on an annual basis. A significant percentage of the base materials purchased for the Partnership's manufacturing process are acquired from related parties. In addition, a significant portion of the Partnership's sales are transacted through Shell Catalysts & Technologies ("Shell"). The Partnership compensates Shell with a 2% sales commission or royalty fee on specific sales transactions.

3. Summary of Significant Accounting Policies:

These financial statements have been prepared in accordance with generally accepted accounting principles. These financial statements are accounted for on a historical cost basis and do not reflect the results of any purchase accounting adjustments recorded in the Partners' respective financial statements.

Cash and Cash Equivalents. Cash and cash equivalents include investments with original terms to maturity of 90 days or less from the time of purchase.

Restricted Cash. Restricted cash, which is restricted as to withdrawal or usage, is classified separately from cash and cash equivalents on the Partnership's balance sheets. The Partnership had no restricted cash balances as of December 31, 2024 and 2023.

Trade Accounts Receivables and Allowance for Doubtful Accounts. Trade accounts receivables are recorded at the invoiced amount and do not bear interest. The Partnership maintains allowances for doubtful accounts for estimated losses resulting from the inability of its customers to make required payments. Allowances for doubtful accounts are based on historical experience and known factors regarding specific customers. If the financial condition of the Partnership's customers were to deteriorate, resulting in an impairment of their ability to make payments, additional allowances would be required. Account balances are charged off against the allowance when it is probable the receivable will not be recovered.

Inventories. Inventories are stated at the lower of cost or net realizable value, valued on the first-in, first-out ("FIFO") method. The Partnership establishes reserves for slow-moving and obsolete inventory.

ZEOLYST INTERNATIONAL
NOTES TO FINANCIAL STATEMENTS
(in thousands)

Property, Plant and Equipment. Property, plant, and equipment are carried at cost and include expenditures for new facilities and major renewals and betterments. Interest is capitalized on capital projects as applicable. Maintenance, repairs and minor renewals are charged to expense as incurred. When assets are sold or otherwise disposed of, the related cost and accumulated depreciation are removed from the accounts, and any resulting gain or loss is included in the results of operations.

Depreciation is generally provided on the straight-line method based on estimated useful lives of the assets, ranging up to 33 years for buildings and improvements and 10 years for machinery and equipment.

We perform an impairment review of property, plant and equipment and other long-lived assets when events and circumstances indicate that those assets may be impaired by comparing the carrying amount of the assets to their fair value. Fair value is determined using quoted market prices where available, or other techniques including discounted cash flows. The Partnership's estimates of future cash flows involve assumptions concerning future operating performance, economic conditions, and technological changes that may affect the future useful lives of the assets.

Leases. The Partnership has an evergreen land lease agreement with a remaining lease term of 27 years as of December 31, 2024. Accounting Standards Codification Topic 842, Leases ("ASC 842"), does not provide definitive guidance as to determining the length of evergreen leasing arrangements. As such, the Partnership estimated the term of the lease agreement to be commensurate with the estimated useful life of the buildings located on the land that is being leased. Upon adoption of ASC 842 on January 1, 2019, the Partnership assigned a 33 year life to the land lease agreement.

When the Partnership enters into an arrangement, at inception, the Partnership determines if the arrangement contains a lease and whether that lease meets the classification criteria of a finance or operating lease. The Partnership's lease arrangement only contains lease components. The Partnership's lease agreement does not contain any material residual value guarantees or material restrictive covenants.

The Partnership recognizes a right-of-use lease asset and lease liability at the lease commencement date based on the present value of the remaining lease payments over the lease term. The Partnership was unable to readily determine the discount rate implicit in the lease agreement in accordance with the policy. As such, the Partnership utilized its incremental borrowing rate over the relevant lease term, which is the rate of interest that it would have to pay to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment. Short-term leases, which have an initial term of twelve months or less, are not recorded on the Partnership's balance sheet.

Lease expense for the operating lease is recognized on a straight-line basis over the lease term. The amortization expense component of the right-of-use lease asset is included in cost of goods sold and in selling, general and administrative expenses on the accompanying statements of operations and accumulated earnings.

Intangibles and Other Long-term Assets. Other long-term assets primarily include intangible assets, at cost and spare parts. In May 2017, the Partnership made a $6,500 strategic investment for license of materials-based solutions for catalytic and separations processes. In April 2018, the Partnership made a $4,000 strategic investment to buy down royalty obligations related to certain license agreements. The Partnership amortizes these intangible assets over a ten-year period and includes the expense in selling, general and administrative expenses on the accompanying statements of operations and accumulated earnings. The Partnership incurred intangible asset related amortization expense of $1,050 for the years ended December 31, 2024, 2023 and 2022, respectively, related to these investments.

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Estimated future aggregate amortization expense of intangible assets is as follows:

Year	Amount
2025	$ 1,050
2026	1,050
2027	617
2028	133
2029	—
Thereafter	—
Total estimated future aggregate amortization expense	$ 2,850

Revenue Recognition. In determining the appropriate amount of revenue to be recognized as the Partnership fulfills its obligations under its agreements, the Partnership performs the following steps: (i) identification of the contract with the customer; (ii) determination of whether the promised goods or services are performance obligations, including whether they are distinct in the context of the contract; (iii) measurement of the transaction price; (iv) allocation of the transaction price to the performance obligations based on estimated selling prices; and (v) recognition of revenue when (or as) the Partnership satisfies each performance obligation.

The Partnership identifies a contract when an agreement with a customer creates legally enforceable rights and obligations, which occurs when a contract has been approved by both parties, the parties are committed to perform their respective obligations, each party's rights and payment terms are clearly identified, commercial substance exists and it is probable that the Partnership will collect the consideration to which it is entitled.

The Partnership may recognize revenue from bill-and-hold arrangements initiated by a customer. Under these bill-and-hold arrangements, a customer pays for the goods, but does not take physical possession immediately. The Partnership considers satisfaction of performance obligations when they have finished manufacturing the products based on the agreed upon specifications in accordance with the order. These products are custom made to each customer's specifications and cannot be made available for use with another customer's order. Once the goods have been segregated in a designated space in the warehouse and the customer has been invoiced, title to the goods and risk of loss has transferred to the customer. The customers have access to their products to inspect and can take possession prior to the scheduled delivery dates.

The Partnership may offer rebates to customers who have reached a specified volume of optional purchases. The Partnership recognizes rebates given to customers as a reduction of revenue based on an allocation of the cost of honoring rebates earned and claimed to each of the underlying revenue transactions that result in progress by the customer toward earning the rebate. Rebates are recognized at the time revenue is recorded. The Partnership measures the rebate obligation based on the estimated amount of sales that will result in a rebate at the adjusted sales price per the respective sales agreement.

The Partnership recognizes revenue when all essential elements of the sales order have shipped and both title and risk of loss has passed to the customer. Hydrocracking and specialty catalyst orders are typically filled by a number of individual shipments, and those shipments may span the end of a fiscal quarter or year. If a portion of the order has not shipped and it is essential to the functionality of the customer's end use, revenue is recognized when the order is completed. A shipment is considered essential if each individual shipment has no value to the customer on a stand-alone basis and if the remaining shipment is not considered inconsequential and perfunctory.

The Partnership currently reserves approximately 2% of the Hydrocracking catalyst sales due to a clause in the contract that allows customers to return up to 5% of the unused products they purchase within 90 days, and based on historical experience. The total sales returns reserve was $1,188 and $1,052 for the years ended December 31, 2024 and 2023, respectively.

Shipping and Handling. Amounts billed to a customer in a sale transaction related to shipping and handling, if any, represent revenues earned for the goods provided and are classified as revenue. Costs related to shipping and handling of

products shipped to customers are classified as cost of goods sold. See Note 5 for disclosures regarding the recognition of revenue for shipping and handling costs that are billed to customers.

Research and Development: Research and development costs of $17,667, $15,388 and $15,102 for the years ended December 31, 2024, 2023 and 2022, respectively, were expensed as incurred and reported in selling, general and administrative expenses in the accompanying statements of operations and accumulated earnings. Costs include salaries, contractor fees, building costs, utilities and administrative expenses.

Foreign Exchange Transactions. The functional currency of the Partnership is the U.S. Dollar. The Partnership enters into transactions that are denominated in other currencies. Gains and losses on foreign currency transactions are included in other (income) / expense, net on the accompanying statements of operations and accumulated earnings. Foreign exchange (gain) loss of $1,296, $(67) and $1,049 were recognized for the years ended December 31, 2024, 2023 and 2022, respectively.

Fair Value Measurements. The Partnership's financial assets and liabilities are reflected in the financial statements at amortized cost which approximates fair market value. Fair value is defined as the price at which an asset could be exchanged in a current transaction between willing market participants. A liability's fair value is defined as the amount that would be paid to transfer the liability to a market participant, not the amount that would be paid to settle the liability with a creditor. The Partnership's cash balances approximate fair value due to their short-term maturity.

Use of Estimates. The preparation of the Partnership's financial statements in conformity with generally accepted accounting principles requires management to make estimates that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

Revision of Previously Issued Financial Statements.

During the preparation of the financial statements for the year ended December 31, 2024, the Partnership identified an error in prior period cost of goods sold. Although the Partnership has determined that this error did not have a material impact on its previously issued financial statements, it has revised the accompanying financial statements to correct for this error and to reflect the associated decrease in cost of goods sold of $5.9 million and $2.6 million for the years ended December 31, 2023 and December 31, 2022, respectively.

The revision had no net impact on cash flows from operating, investing or financing activities in the accompanying statements of cash flows. The applicable notes to the accompanying financial statements have also been revised to correct for this error.

The following table summarizes the effect of the revision on the affected line items within the accompanying statements of operations and accumulated earnings:

	Year ended December 31, 2023			Year ended December 31, 2022		
	As reported	Adjustment	As revised	As reported	Adjustment	As revised
Cost of goods sold	$ 212,513	$ (5,930)	$ 206,583	$ 154,498	$ (2,646)	$ 151,852
Gross profit	100,450	5,930	106,380	110,562	2,646	113,208
Operating income	63,464	5,930	69,394	72,131	2,646	74,777
Net income	64,414	5,930	70,344	71,351	2,646	73,997
Accumulated earnings at beginning of year	266,089	(3,426)	262,663	264,738	(6,072)	258,666
Accumulated earnings at end of year	274,503	2,504	277,007	266,089	(3,426)	262,663

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The following table summarizes the effect of the revision on the affected line items within the balance sheets:

	December 31, 2023		
	As reported	Adjustment	As revised
ASSETS			
Inventories	$ 114,822	$ 2,504	$ 117,326
Total current assets	238,844	2,504	241,348
Total assets	360,746	2,504	363,250
PARTNERS' CAPITAL			
Accumulated earnings	274,503	2,504	277,007
Net partners' capital	329,433	2,504	331,937
Total liabilities and partners' capital	360,746	2,504	363,250

The following table summarizes the effect of the revision on the affected line items within the statements of cash flows:

	Year ended December 31, 2023			Year ended December 31, 2022		
	As reported	Adjustment	As revised	As reported	Adjustment	As revised
Cash flows from operating activities:						
Net income	$ 64,414	$ 5,930	$ 70,344	$ 71,351	$ 2,646	$ 73,997
Working capital changes that provided (used) cash:						
Inventories	21,222	(5,930)	15,292	(24,764)	(2,646)	(27,410)

4. Recently Issued Accounting Standards:

In November 2024, the Financial Accounting Standards Board ("FASB") issued guidance requiring public business entities to disclose additional information on the nature of certain expenses presented in the income statement. The new guidance requires tabular disclosure of significant expense categories and qualitative descriptions for amounts not disaggregated from relevant expense categories. Public business entities are required to define selling expenses and disaggregate the components. The new guidance is effective for fiscal years beginning after December 15, 2026 and interim periods within fiscal years beginning after December 15, 2027, with early adoption permitted. The requirements must be applied prospectively however public business entities have the option to apply the guidance retrospectively. The disclosure will be implemented as required for the fiscal year ended December 31, 2027. The Partnership is currently evaluating the impact of this guidance.

In October 2023, FASB issued guidance to amend either presentation or disclosure requirements related to fourteen subtopics in the FASB Accounting Standards Codification, that are currently in the SEC Regulation S-X or Regulation S-K. The new guidance was issued in response to the SEC's ruling on disclosure simplification. For entities subject to existing SEC disclosure requirements, the effective date of each amendment of the topics will be the date that the SEC removes the related disclosure from Regulation S-X or Regulation S-K. The guidance must be applied prospectively, with no early adoption permitted for entities subject to those existing SEC disclosures. The Partnership is currently evaluating the impact of the new guidance as it pertains to the fourteen subtopics that would impact the business and will apply prospectively once in effect.

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5. Revenue from Contracts with Customers:

The Partnership applies the five-step revenue recognition model to each contract with its customers. Evidence of a contract between the Partnership and its customers may take the form of a master service agreement ("MSA"), a MSA in combination with an underlying purchase order, a combination of a pricing quote with an underlying purchase order or an individual purchase order received from a customer. The Partnership and certain of its customers enter into MSAs that establish the terms, including prices, under which orders to purchase goods may be placed. In cases where the MSA contains a distinct order for goods or contains an enforceable minimum quantity to be purchased by the customer, the Partnership considers the MSA to be evidence of a contract between the Partnership and its customer as the MSA creates enforceable rights and obligations. In cases where the MSA does not contain a distinct order for goods, the Partnership's contract with a customer is the purchase order issued under the MSA. Customers of the Partnership may also negotiate orders via pricing quotes, which typically detail product pricing, delivery terms and payment information. When a customer procures goods under this method, the Partnership considers the combination of the pricing quote and the purchase order to create enforceable rights and obligations. Absent either a MSA or pricing quote, the Partnership considers an individual purchase order to create enforceable rights and obligations.

The Partnership identifies a performance obligation in a contract for each promised good that is separately identifiable from other promises in the contract and for which the customer can benefit from the good. The Partnership's contracts have a single performance obligation, which is the promise to transfer individual goods to the customer. Single performance obligations are satisfied according to the shipping terms noted within the MSA or purchase order.

As described above, the Partnership's MSAs with its customers may outline prices for individual products or contract provisions. Revenue from product sales are recorded at the sales price, which includes estimates of variable consideration for which reserves are established and which result from discounts, returns or other allowances that are offered within contracts between the Partnership and its customers.

The Partnership recognizes revenues when performance obligations under the terms of a contract with its customer are satisfied, which generally occurs at a point in time by transferring control of a product to the customer. The Partnership determines the point in time when a customer obtains control of a product and the Partnership satisfies the performance obligation by considering factors including when the Partnership has a right to payment for the product, the customer has legal title to the product, the Partnership has transferred possession of the product, the customer has assumed the risks and rewards of ownership of the product and the customer has accepted the product. Revenue is measured as the amount of consideration the Partnership expects to receive in exchange for transferring goods. The Partnership does not have any significant payment terms as payment is received at, or shortly after, the point of sale.

Contract Assets and Liabilities

A contract asset is a right to consideration in exchange for goods that the Partnership has transferred to a customer when that right is conditional on something other than the passage of time. A contract liability exists when the Partnership receives consideration in advance of performance obligations. The Partnership has not recorded any contract assets or contract liabilities on its balance sheet as of December 31, 2024 and 2023.

Practical Expedients and Accounting Policy Elections

The Partnership has elected to use certain practical expedients and has made certain accounting policy elections as permitted under the revenue recognition guidance. Certain of the Partnership's contracts with customers are based on an individual purchase order; thus, the duration of these contracts are for one year or less. The Partnership has made an accounting policy election to omit certain disclosures related to remaining performance obligations for contracts which have an initial term of one year or less.

The Partnership uses an output method to recognize revenues related to performance obligations. These performance obligations, as described above, are satisfied within a calendar year. As such, the Partnership has elected to utilize the "as-invoiced" practical expedient, which permits the Partnership to recognize revenue in the amount to which it has a right to invoice the customer, provided that the amount corresponds directly with the value provided by the performance obligation as completed to date.

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When the Partnership performs shipping and handling activities after the transfer of control to the customer (e.g. when control transfers prior to delivery), they are considered fulfillment activities as opposed to separate performance obligations, and the Partnership recognizes revenue upon the transfer of control to the customer. Accordingly, the costs associated with these shipping and handling activities are accrued when the related revenue is recognized under the Partnership's policy election. The Partnership expenses incremental costs of obtaining a contract as incurred if the expected amortization period of the asset that the Partnership would have recognized is one year or less. Sales, value added and other taxes the Partnership collects concurrent with revenue producing activities are excluded from revenues.

Disaggregated Revenue

The following table disaggregates the Partnership's sales by end use for the years ended December 31, 2024, 2023 and 2022:

	Years ended December 31,		
	2024	**2023**	**2022**
Clean fuels, emission control & other	$ 180,506	$ 254,066	$ 206,907
Polyethylene, polymers & engineered plastics	52,573	58,897	58,153
Total	$ 233,079	$ 312,963	$ 265,060

6. Accounts Receivable and Allowance for Doubtful Accounts:

The components of accounts receivable are as follows:

	December 31,	
	2024	**2023**
Trade accounts receivable	$ 46,071	$ 114,874
Allowance	(1,188)	(1,052)
	$ 44,883	$ 113,822

7. Inventories:

Inventories were classified is as follows:

	December 31,	
	2024	**2023**
Finished products and work in process	$ 116,593	$ 108,987
Raw materials and containers	6,835	8,339
	$ 123,428	$ 117,326

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8. Property, Plant and Equipment:

A summary of property, plant and equipment, at cost, and related accumulated depreciation is as follows:

	December 31,	
	2024	2023
Buildings and improvements	$ 70,265	$ 69,647
Machinery and equipment	222,162	218,146
Construction in progress	2,819	2,441
	295,246	290,234
Less: accumulated depreciation	(199,231)	(185,023)
	$ 96,015	$ 105,211

Depreciation expense was $14,871, $15,217 and $19,254 for the years ended December 31, 2024, 2023 and 2022, respectively. Disposal of assets reduced gross property, plant and equipment by $610, $521 and $1,014, respectively with a loss of $21, $79 and $37 for the years ended December 31, 2024, 2023 and 2022, respectively.

9. Leases:

Operating lease costs of $310 are included in cost of goods sold on the accompanying statements of operations and accumulated earnings for the years ended December 31, 2024, 2023 and 2022, respectively. Cash payments on operating leases included in operating cash flows was $310 for the years ended December 31, 2024, 2023 and 2022, respectively. The remaining lease term is 27 years with a weighted average discount rate of 3.25%. The current portion of the lease liability is included on the Partnership's balance sheets in other current liabilities. There were no finance lease costs for the year ended December 31, 2024.

Maturities of lease liabilities as of December 31, 2024 are as follows:

Year	Operating Lease
2025	$ 310
2026	310
2027	310
2028	310
2029	310
Thereafter	6,820
Total lease payments	8,370
Less: Interest	(2,789)
Total lease liabilities	$ 5,581

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10. Accrued Liabilities:

A summary of accrued liabilities is as follows:

	December 31,	
	2024	2023
Royalties and license fees	$ 763	$ 2,111
Commissions	6	1,212
Rebates	91	124
Property tax	238	211
Other	175	420
	$ 1,273	$ 4,078

11. Revolver:

On March 2, 2016, the Partnership entered into a five-year revolving line of credit facility of $60,000, which carries an initial interest rate of LIBOR or the base rate plus an interest margin of 0.75% per annum. On May 26, 2020, this agreement was amended to extend the term to May 25, 2022. On November 30, 2021, this agreement was amended again to extend the term to November 29, 2026. The interest rate on the facility was LIBOR or the base rate plus an interest margin of 1.00% per annum. On March 13, 2023, the Partnership amended the revolving line to replace LIBOR with SOFR as the benchmark interest rate. Following this amendment, the revolving line of credit facility will bear interest at an adjusted term SOFR rate or the base rate plus an interest margin of 1.00% per annum.

As of December 31, 2024, availability under this agreement was $60,000. A commitment fee is paid to the bank for this agreement.

The revolving credit agreement contains certain restrictions and covenants that require the Partnership to maintain a minimum partners' equity, as defined, of $200,000 plus 10% of net income, and a minimum EBITDA of $40,000 on a last twelve month basis measured quarterly. The Partnership was in compliance with all covenants during 2024.

Cash payments for interest were approximately $174, $157 and $306 for the years ended December 31, 2024, 2023 and 2022, respectively.

The fair value of a financial instrument is the amount at which the instrument could be exchanged in a current transaction. The carrying amount of the revolving line of credit approximates fair value because it is a short term liquidity tool to fund operations, which is drawn down and paid back with cash generated from operations.

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12. Partners' Contributions:

In accordance with the Agreement, in the event that cash flow from operations is insufficient to meet the Partnership's requirements, following a majority vote by the Management Committee of the Partnership to request capital from the partners, the partners will provide additional capital to enable the Partnership to meet its obligations. No such contributions were made during the years ended December 31, 2024, 2023 or 2022 as the Partnership had the ability to finance operations through cash flow from operations and borrowings under the Partnership's revolving line of credit facility.

13. Income Taxes:

As a partnership, Zeolyst International is not liable for the payment of taxes on income in the U.S. Net income and losses are allocated to the respective partners on an annual basis, and it is the partners' responsibility to pay income taxes, if any, thereon according to their respective tax positions.

14. Commitments and Contingent Liabilities:

In 1998, the Partnership entered into a ten year tolling agreement ("the Tolling Agreement") with Shell, a related party, for the manufacture of specialty extruded products. Effective January 2004, the 1998 Tolling Agreement was replaced by a new evergreen ten-year tolling agreement. Both parties can terminate this agreement without cause with twenty-four months notice. By letter dated January 19, 2024, Shell provided a notice of termination of the Tolling Agreement effective twenty-four months from the date of such letter. Negotiations are advancing between the parties to create a replacement for the Tolling Agreement, which is set to terminate in January 2026. The Partnership pays Shell for materials utilized plus a daily charge rate based on the actual days of production. This charge is included in cost of goods sold and totaled $27,610, $28,698 and $20,134 for the years ended December 31, 2024, 2023 and 2022, respectively. In addition, for certain capital expenditures, that are beneficial to the Partnership, the parties will mutually agree on future adjustments to the daily charge rates or propose an alternative method of the Partnership's contribution to those costs.

15. Related Party Transactions:

The Partnership maintains certain policies and procedures for the review, approval, and ratification of related party transactions. All significant relationships and transactions are separately identified by management if they meet the definition of a related party or a related party transaction. Related party transactions include transactions that occurred during the year, in which the Partnership was or will be a participant and which any related person had or will have a direct or indirect material interest. Due to the nature of the Partnership, material related party transactions are identified on a transaction-based approach. The types of transactions identified and reviewed include, but are not limited to, sales of products, purchases of inventory, tolling costs, sales and marketing costs, research and development and management-related fees. All related party transactions are reviewed, approved and documented by the appropriate level of the Partnership's management in accordance with these policies and procedures.

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Ecovyst

Pursuant to the Contribution Agreement, PQ transferred and Ecovyst assumed PQ's interest in a lease agreement by and between PQ and the Partnership dated February 1, 1988 (the "Lease") pursuant to which the Partnership leases certain land used in its Kansas City production facilities, and PQ transferred to Ecovyst the land underlying the Partnership's Kansas City production facility. The Lease, which has been recorded as an operating lease, provided for rental payments of $310 for the years ended December 31, 2024, 2023 and 2022, respectively. The rent expense is included in the cost of goods sold line item in the accompanying statements of operations and accumulated earnings. The term of the Lease continues as long as the agreement is in effect. The Partnership purchases certain of its raw materials from Ecovyst and is charged for various manufacturing costs incurred at the Ecovyst Kansas City production facility. The amount of these costs charged to the Partnership by Ecovyst during the years ended December 31, 2024, 2023 and 2022 were $17,315, $20,594 and $23,699, respectively. These costs are a component of production costs and are included in the cost of goods sold line item in the accompanying statements of operations and accumulated earnings when the inventory is sold. Certain administrative, marketing, engineering, management-related and research and development services are provided to the Partnership by Ecovyst. During the years ended December 31, 2024, 2023 and 2022, the Partnership was charged by Ecovyst $17,203, $14,758 and $13,908, respectively, for these services. These amounts are included in the selling, general and administrative line item in the accompanying statements of operations and accumulated earnings. In addition, certain product demonstration costs of $1,029, $1,819 and $1,621 during the years ended December 31, 2024, 2023 and 2022, respectively, were recorded in the cost of goods sold line of the accompanying statements of operations and accumulated earnings.

The Partnership recognized no sales to Ecovyst for the year ended December 31, 2024, $236 of sales to Ecovyst for the year ended December 31, 2023 and no sales to Ecovyst during the year ended December 31, 2022. As of December 31, 2024 and 2023, the accounts payable to affiliates consisted of $2,794 and $3,164 due to Ecovyst. As of December 31, 2024 and 2023, there were no trade receivables due from Ecovyst.

In December 2013 and annually thereafter, Ecovyst and the Partnership entered into ten year real estate tax abatement agreements with the Unified Government of Wyandotte County in Kansas City, Kansas (the "Unified Government"). The agreements utilize an Industrial Revenue Bond ("IRB," "IRBs") financing structure to achieve a 75% real estate tax abatement on the value of the improvements that were constructed during the expansion of the then-current fiscal year to Ecovyst and the Partnership's facilities at the jointly-operated Kansas City, Kansas plant. The IRB financing structure requires Ecovyst to lease its rights to the facility improvements to the Unified Government, which leases the improvements back to Ecovyst. Ecovyst's rental payments under the sub-leases of the improvements are equal to the amount of the interest payable on the IRBs that the Unified Government sells to Ecovyst. Ecovyst's sublease payment obligations and the IRB interest payment receivables have been presented net, as the sublease rental payment obligations and the IRB interest payment receivables meet the criteria for right of set off conditions under GAAP.

Shell Catalysts & Technologies

Shell Catalysts & Technologies include CRI, Criterion, Shell Development Company, Shell Research and Technology Center-Amsterdam, CRI Center Marketing Asia Pacific, Shell International Oil Products, CRI Belgium, CRI Technology Services and Royal Dutch Shell affiliates. As described in Note 2, a significant portion of the Partnership's sales are transacted through Shell. During the years ended December 31, 2024, 2023 and 2022, the Partnership recognized sales transacted through Shell of $101,223, $133,618 and $108,584, respectively. The Partnership purchases certain of its raw materials and is charged for tolling, customer distribution and packaging costs incurred by Shell. The amount of these costs charged to the Partnership during the years ended December 31, 2024, 2023 and 2022 were $29,502, $32,282 and $23,799, respectively. These costs are a component of production costs and are included in the cost of goods sold line item in the accompanying statements of operations and accumulated earnings when the inventory is sold. Certain engineering, management-related, broker-related, and research and development services are provided to the Partnership by Shell. During the years ended December 31, 2024, 2023 and 2022, the Partnership was charged $23,388, $20,699 and $19,554, respectively, for these services. These amounts are included in the selling, general and administrative line item in the accompanying statements of operations and accumulated earnings.

Shell constructed a manufacturing asset at its facility wherein the Partnership agreed to share the cost of construction as both parties benefit from the associated asset. The asset was placed in service in 2024 and is being

depreciated using the straight-line method over its estimated useful life. As of December 31, 2024, the balance of this asset amounted to $9,309, and is recorded in other long-term assets on the balance sheet. Depreciation expense related to this asset is $78 for the year ended December 31, 2024.

As of December 31, 2024 and 2023, the accounts payable to affiliates balance consisted of $5,770 and $9,014, respectively, due to Shell. Included in trade accounts receivable as of December 31, 2024 and 2023 was $3,666 and $36,149, respectively, of receivables related to sales transacted through Shell, as described above.

Zeolyst C.V.

Zeolyst C.V. is a limited partnership formed in 1993 pursuant to a joint venture agreement between PQ Zeolites B.V. and Shell for the purpose of the production of Zeolite powders. The Partnership entered into an agreement with Zeolyst C.V. to purchase Zeolite powders manufactured by Zeolyst C.V. Under the terms of the agreement, products manufactured by Zeolyst C.V. are supplied solely to the Partnership. The Partnership has performed a qualitative and quantitative analysis and concluded that for Zeolyst C.V. for which it holds a variable interest but will not absorb a majority of the expected losses or residual returns, the Partnership is not the primary beneficiary and therefore, this VIE was not consolidated in the Partnership's financial statements. The Partnership has no unfunded commitments or guarantees as a result of its involvement with Zeolyst C.V.

The total carrying value of assets and liabilities for Zeolyst C.V was $105,242 and $5,484 as of December 31, 2024 and was $114,797 and $11,284 as of December 31, 2023, respectively. The Partnership currently does not have any exposure to any losses by Zeolyst C.V. The Partnership has purchased $49,585, $48,906 and $39,027 through the sales agreement during the years ended December 31, 2024, 2023 and 2022, respectively. These costs are a component of production costs and are included in the cost of goods sold line item in the accompanying statements of operations and accumulated earnings when the inventory is sold.

There were no accounts receivable from affiliates due from Zeolyst C.V. as of December 31, 2024 and $7,111 of accounts receivable from affiliates due from Zeolyst C.V. as of December 31, 2023. There were $4,772 of accounts payable due to Zeolyst C.V. as of December 31, 2024 and no accounts payable due to Zeolyst C.V. as of December 31, 2023.

16. Subsequent Events:

The Partnership has evaluated subsequent events from the balance sheet date through February 28, 2025 and determined there are no further items to disclose.