

2023 Annual Report



We protect and beautify the world®



Our Valued Shareholders,

I'm energized by our more than 50,000 PPG team members who delivered excellent results for the company in 2023, our 140th year. The resiliency of our global business portfolio combined with the efforts and determination of our people to "make it happen" for our customers were key factors in our ability to overcome a challenging macro environment and deliver on our purpose — to protect and beautify the world.

In 2023, the PPG team delivered:

- **record financial performance** through margin recovery, full-year operating cash generation of \$2.4 billion and delivery of organic sales growth by supporting our customers' productivity and sustainability needs. PPG achieved records in sales, adjusted earnings per diluted share (EPS) and operating cash flow in 2023.
- **the implementation of our Enterprise Growth Strategy**, which drove \$150 million of incremental sales in the first year, including solid growth from sales of our innovative products for electric vehicles and powder coatings.
- **digital, customer-focused innovations** that were adopted by customers. For example, our PPG LINQ™ cloud-based platform and PPG MOONWALK® paint mixing machines contributed to nearly 2,000 automotive body shop installations for PPG.

We divested several non-core assets, including our European and Australian traffic solutions businesses in 2023, and recently announced reviews of strategic alternatives for PPG's architectural coatings business in the U.S. and Canada, and PPG's silicas product business. We've also made important progress in reducing complexity in our product offering, driving down working capital.

The success of the team's work throughout the year has enabled PPG to continue to reward our shareholders, as we paid about \$600 million in dividends and completed about \$100 million of share repurchases in 2023. PPG has raised its annual dividend payout for 52 consecutive years and has paid uninterrupted annual dividends for 124 years.

PPG also continued to take actions to further advance its sustainability commitments. In 2023, we became the first U.S.-based coatings manufacturer to receive validation from the Science Based Targets initiative (SBTi) for scope 1, 2 and 3 greenhouse gas emissions reduction targets. In addition, PPG announced 2030 sustainability goals that focus on driving sales of sustainably advantaged products that help our customers achieve their sustainability objectives while reducing the environmental impact of our products. In 2023, 44% of our sales were from products and processes that address multiple sustainability benefits, including lower volatile organic compound emissions, enhanced energy efficiency, improved durability, or the use of renewable raw materials. In addition, we also completed our 500th COLORFUL COMMUNITIES® project. Over the course of 500 projects, PPG employee volunteers have reached diverse communities and important spaces in need of bright and colorful transformations, positively impacting more than 9.2 million people in 50 countries.

2023 financial performance:



We are eager to build on the progress we've achieved in 2023. We are confident that we will deliver positive sales volume in 2024 and leverage key share gains in several businesses. We will benefit from executing on a significant order backlog in our aerospace business, growing our well-positioned businesses in Mexico and continuing to focus on various other key growth initiatives, including powder coatings, electric vehicle products and customer-facing digital solutions. Lastly, we entered 2024 with a strong balance sheet, which provides us with the flexibility for further shareholder value creation going forward.

I want to thank our employees across the world for positioning the company for growth and value creation in 2024 and beyond for the benefit of all stakeholders.

Thank you for your continued confidence and investment in PPG.

Tim Knavish
Chairman and Chief Executive Officer, PPG

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 10-K**

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2023

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 1-1687



PPG INDUSTRIES, INC.

(Exact name of registrant as specified in its charter)

Pennsylvania

25-0730780

(State or other jurisdiction of incorporation or organization)

(I.R.S. Employer Identification No.)

One PPG Place Pittsburgh Pennsylvania

15272

(Address of principal executive offices)

(Zip code)

Registrant's telephone number, including area code:

412 434-3131

Securities Registered Pursuant to Section 12(b) of the Act:

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock – Par Value \$1.66 2/3	PPG	New York Stock Exchange
0.875% Notes due 2025	PPG 25	New York Stock Exchange
1.875% Notes due 2025	PPG 25A	New York Stock Exchange
1.400% Notes due 2027	PPG 27	New York Stock Exchange
2.750% Notes due 2029	PPG 29A	New York Stock Exchange

Securities Registered Pursuant to Section 12(g) of the Act: None

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, 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 and posted 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 and post 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. (Check one):

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
(Do not check if a smaller reporting company)		Emerging growth company	<input type="checkbox"/>

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.

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).

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

The aggregate market value of common stock held by non-affiliates as of June 30, 2023, was \$34,856 million.

As of January 31, 2024, 235,254,665 shares of the Registrant's common stock, with a par value of \$1.66²/₃ per share, were outstanding. As of that date, the aggregate market value of common stock held by non-affiliates was \$33,112 million.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of PPG Industries, Inc. Proxy Statement for its 2024 Annual Meeting of Shareholders (the "Proxy Statement") to be filed with the Securities and Exchange Commission within 120 days after the end of the Company's fiscal year, are incorporated herein by reference into Part III of this report.

PPG INDUSTRIES, INC. AND CONSOLIDATED SUBSIDIARIES

As used in this report, the terms “PPG,” “Company,” “Registrant,” “we,” “us” and “our” refer to PPG Industries, Inc., and its subsidiaries, taken as a whole, unless the context indicates otherwise.

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Part I

Item 1. Business

PPG Industries, Inc. manufactures and distributes a broad range of paints, coatings and specialty materials. PPG was incorporated in Pennsylvania in 1883. PPG's vision is to be the first-choice partner to meet our customers' evolving needs for innovative paints, coatings and surface solutions to protect and beautify the world.

PPG has a proud heritage with a demonstrated commitment to innovation, sustainability, community engagement and development of leading-edge paint, coatings and specialty materials technologies. Through dedication and industry-leading expertise, we solve our customers' biggest challenges, collaborating closely to find the right path forward. PPG is a global leader with manufacturing facilities and equity affiliates in more than 70 countries.

PPG supplies paints, coatings and specialty materials to customers serving a wide array of end-uses, including industrial equipment and components; packaging material; aircraft and marine equipment; automotive original equipment; automotive refinish and aftermarket; pavement marking products; as well as coatings for other industrial and consumer products. PPG also serves commercial and residential new build and maintenance customers by supplying coatings to painting and maintenance contractors and directly to consumers for decoration and maintenance.

The coatings industry is highly competitive and consists of several large firms with global presence and many firms supplying local or regional markets. PPG competes in its primary markets with the world's largest coatings companies, most of which have global operations, and with many regional coatings companies.

PPG's business is comprised of two reportable business segments: Performance Coatings and Industrial Coatings as described below:

PERFORMANCE COATINGS

<i>Strategic Business Unit</i>	<i>Products</i>	<i>Primary Customers / End-uses</i>	<i>Main Distribution Methods</i>	<i>Primary Brands</i>
Aerospace Coatings	Coatings, sealants, transparencies, transparent armor, adhesives, engineered materials, packaging and chemical management services for the aerospace industry	Commercial, military, regional jet and general aviation aircraft	Direct to customers and company-owned distribution network	PPG®
Architectural Coatings Americas and Asia Pacific	Paints, wood stains, adhesives, sealants and purchased sundries	Painting and maintenance contractors and consumers for decoration and maintenance of residential and commercial building structures	Company-owned stores, home centers and other regional or national consumer retail outlets, paint dealers, concessionaires, independent distributors and direct to consumers	PPG®, GLIDDEN®, COMEX®, OLYMPIC®, DULUX® (in Canada), PPG PITTSBURGH PAINTS®, MULCO®, FLOOD®, LIQUID NAILS®, SICO®, RENNER®, TAUBMANS®, WHITE KNIGHT®, BRISTOL® and HOMAX®
Architectural Coatings Europe, Middle East and Africa (EMEA)				SIGMA®, HISTOR®, SEIGNEURIE®, GUITTET®, PEINTURES GAUTHIER®, RIPOLIN®, JOHNSTONE'S®, LEYLAND®, PRIMALEX®, DEKORAL®, TRILAK®, PROMINENT PAINTS®, GORI®, BONDEX®, DANKE!® and TIKKURILA®
Automotive Refinish Coatings	Coatings, solvents, adhesives, sealants, purchased sundries, software and paint films	Automotive and commercial transport/fleet repair and refurbishing, light industrial coatings and specialty coatings for signs	Independent distributors and direct to customers	PPG®, SEM®, SPRINT®
Protective and Marine Coatings	Coatings and finishes for the protection of metals and structures	Metal fabricators, heavy duty maintenance contractors and manufacturers of ships, bridges and rail cars	Direct to customers, company-owned architectural coatings stores, independent distributors and concessionaires	PPG®
Traffic Solutions	Paints, thermoplastics, pavement marking products and other advanced technologies for pavement marking	Government, commercial infrastructure, painting and maintenance contractors	Direct to customers, government agencies and independent distributors	Ennis-Flint®

Segment Overview

This reportable business segment primarily supplies a variety of protective and decorative coatings, adhesives, sealants and finishes along with pavement marking products, paint strippers, stains and related chemicals, transparencies, transparent armor and paint films.

Alliances

PPG has an established alliance with Asian Paints Ltd. to serve certain automotive refinish customers in India.

Major Competitive Factors

Product performance, technology, quality, technical and customer service, price, customer productivity, distribution and brand recognition

Global Competitors

Akzo Nobel N.V., Axalta Coating Systems Ltd., BASF Corporation, Benjamin Moore, Hempel A/S, Kansai Paints, the Jotun Group, Masco Corporation, Nippon Paint, RPM International Inc., The Sherwin-Williams Company and 3M Company

Principal Manufacturing and Distribution Facilities

Amsterdam, Netherlands; Birstall, United Kingdom; Busan, South Korea; Carrollton, Texas; Clayton, Australia; Delaware, Ohio; Deurne, Belgium; Ennis, Texas; Gonfreville, France; Greensboro, North Carolina; Huntsville, Alabama; Huron, Ohio; Kunshan, China; Little Rock, Arkansas; Milan, Italy; Mojave, California; Nykvarn, Sweden; Oakwood, Georgia; Ontario, Canada; Ostrow Wielkopolski, Poland; Ruitz, France; Shildon, United Kingdom; Sylmar, California; Stowmarket, United Kingdom; Tepexpan, Mexico; Vantaa, Finland; and Wroclaw, Poland.

INDUSTRIAL COATINGS

<i>Strategic Business Unit</i>	<i>Products</i>	<i>Primary Customers / End-uses</i>	<i>Main Distribution Methods</i>	<i>Primary Brands</i>
Automotive OEM^(a) Coatings	Specifically formulated coatings, adhesives and sealants, metal pretreatments and paint films	Automotive original equipment, including combustion engine, commercial, and electric vehicles, and automotive parts and accessories, including battery-related components	Direct to manufacturing companies and various coatings applicators	PPG®
Industrial Coatings	Specifically formulated coatings, adhesives and sealants and metal pretreatments; services and coatings application	Appliances, agricultural and construction equipment, consumer electronics, building products (including residential and commercial construction), kitchenware, transportation vehicles and numerous other finished products; On-site coatings services within several customer manufacturing locations as well as at regional service centers.		PPG®
Packaging Coatings	Specifically formulated coatings	Metal cans, closures, and plastic and aluminum tubes for food, beverage and personal care, and promotional and specialty packaging		PPG®
Specialty Coatings and Materials	Amorphous precipitated silicas, TESLIN® substrate, Organic Light Emitting Diode (OLED) materials, optical lens materials and photochromic dyes	Silicas - Tire, battery separator and other end-uses TESLIN - Labels, e-passports, drivers' licenses, breathable membranes, loyalty cards and identification cards OLED - displays and lighting Lens materials - optical lenses, coatings and color-change products		PPG® TESLIN®

(a) Original equipment manufacturer (OEM)

<i>Segment Overview</i>	This reportable business segment primarily supplies a variety of protective and decorative coatings and finishes along with adhesives, sealants, metal pretreatment products, optical monomers and coatings, low-friction coatings, precipitated silicas and other specialty materials.
<i>Alliances</i>	PPG has established alliances with Kansai Paints to serve Japanese-based automotive OEM customers in North America and Europe and Asian Paints Ltd. to serve certain aftermarket customers and automotive OEM customers in India.
<i>Major Competitive Factors</i>	Product performance, technology, quality, technical and customer service, price, customer productivity and distribution.
<i>Global Competitors</i>	Akzo Nobel N.V., Axalta Coating Systems Ltd., BASF Corporation, Kansai Paints, Nippon Paint and The Sherwin-Williams Company
<i>Principal Manufacturing and Distribution Facilities</i>	Barberton, Ohio; Cheonan, South Korea; Cieszyn, Poland; Circleville, Ohio; Cleveland, Ohio; Delfzijl, Netherlands; Lake Charles, Louisiana; Oak Creek, Wisconsin; Quattordio, Italy; San Juan del Rio, Mexico; Springdale, Pennsylvania; Sumaré, Brazil; Weingarten, Germany; and Tianjin and Zhangjiagang, China.

Research and Development

(\$ in millions, except percentages)	2023	2022	2021
Research and development costs, including depreciation of research facilities	\$456	\$470	\$463
% of annual net sales	2.5%	2.7%	2.8%

Technology innovation has been a hallmark of PPG's success throughout its history. The Company seeks to optimize its investment in research and development to create new products to drive profitable growth. We align our product development with the macro trends in the markets we serve, including a focus on sustainability and productivity, and leverage core technology platforms to develop products to address unmet market needs. Additionally, we operate laboratories in close geographic proximity to our customers, and we customize our products for our customers' end-use applications. Our history of successful technology introductions is based on a commitment to an efficient and effective innovation process and disciplined portfolio management. We have obtained government funding for a small portion of the Company's research efforts, and we will continue to pursue government funding, where appropriate.

We own and operate several facilities to conduct research and development for new and improved products and processes. In addition to the Company's centralized principal research and development centers (see Item 2. "Properties" of this Form 10-K), operating segments manage their development through centers of excellence. As part of our ongoing efforts to manage our formulations and raw material costs effectively, we operate global competitive sourcing laboratories. Because of our broad array of products and customers, we are not materially dependent upon any single technology platform.

Raw Materials, Energy and Logistics

PPG uses a wide variety of complex raw materials that serve as the building blocks of our manufactured products. The Company's most significant raw materials include resins, reactants, solvents, titanium dioxide, epoxy and emulsions. Raw materials include both organic, primarily petroleum-derived, materials and inorganic materials, including titanium dioxide. Raw materials represent PPG's single largest production cost component.

Most of the raw materials and energy used in production are purchased from outside sources, and the Company has made, and continues to make, supply arrangements to meet our planned operating requirements for the future. Supply of critical raw materials and energy is managed by establishing contracts with multiple sources and identifying alternative materials or technology whenever possible. In support of our decarbonization efforts, we are increasing the amount of renewable energy secured for our operating facilities and increasingly evaluating alternative raw materials that offer sustainable benefits and support the circular economy, including recycled and renewable feedstocks. Prices for certain of our raw materials typically fluctuate with energy prices and global supply and demand changes; however, pricing may be impacted by the fact that the manufacture of our raw materials is several steps downstream from crude oil, natural gas, and other key feedstocks.

Through effective management of raw materials, energy and logistics, the Company aims to maintain a competitive cost position and ensure ongoing security of supply. Security of a sufficient supply of high-quality raw materials is important to PPG's continued success as it allows the Company to increase production as necessary to keep pace with customer demand. While PPG faced certain raw material shortages and logistical challenges during 2022, raw material and logistics availability continued to improve throughout 2023 and is now comparable to pre-pandemic conditions. We continue to focus on improving our competitive cost position and expanding our supply of high-quality raw materials, including strategic initiatives to qualify multiple sources of supply.

We typically experience fluctuating prices for energy and raw materials driven by various factors, including changes in supplier feedstock costs and inventories, global industry activity levels, foreign currency exchange rates, government regulation, and global supply and demand factors. In 2023 raw material costs remained high compared to historic levels, but moderated compared to 2022 levels, resulting in a decrease to our operating costs of more than \$500 million. Given the uncertainty associated with the various factors that drive raw material prices, we are not able to predict the 2024 full-year impact of changes in raw material costs versus 2023; however, we do not currently expect to incur significant raw material inflation during 2024. While raw material costs declined during 2023, the Company continues to incur wage inflation, and anticipates further wage inflation impacts in 2024.

We are subject to existing and evolving standards relating to the regulation and registration of chemicals which could potentially impact the availability and viability of some of the raw materials we use in our production processes. Our ongoing, global product stewardship efforts are directed at maintaining our compliance with these standards. We anticipate that the number of chemical registration regulations will continue to increase globally, and we have implemented programs to track and comply with these regulations.

Our commitment to sustainability extends to our suppliers as an extension of our internal focus on sustainability. The PPG Global Supplier Code of Conduct clarifies our global expectations in the areas of business integrity, labor practices,

associate health and safety, and environmental management. Our Supplier Sustainability Policy builds upon our Global Supplier Code of Conduct by establishing expectations for sustainability within our supply chain. This policy reinforces our expectations that our suppliers, as well as their subcontractors, will comply fully with applicable laws and adhere to internationally recognized environmental, social and corporate-governance standards.

Global Operations

PPG has significant non-U.S. operations. This broad geographic footprint serves to lessen the significance to us of economic impacts occurring in any one region of the world. As a result of our global footprint, we are subject to certain inherent risks, including economic and political conditions in international markets, trade protection measures and fluctuations in foreign currency exchange rates. During 2023, favorable foreign currency translation increased Net sales by approximately \$102 million and Income before income taxes by approximately \$25 million.

Refer to Note 20, "Revenue Recognition" in Item 8 of this Form 10-K for additional geographic information pertaining to sales and Note 21, "Reportable Business Segment Information" in Item 8 of this Form 10-K for geographic information related to PPG's property, plant and equipment.

Seasonality

PPG's Income before income taxes has typically been greater in the second and third quarters and Cash from operating activities has been greatest in the fourth quarter due to end-use market seasonality, primarily in our architectural coatings and traffic solutions businesses. Demand for our architectural coatings and traffic solutions products is typically the strongest in the second and third quarters due to higher home improvement, maintenance and construction activity during the spring and summer months in the U.S., Canada and Europe. The Latin American paint season is the strongest in the fourth quarter. These cyclical activity levels result in the collection of outstanding receivables and lower inventory on hand in the fourth quarter generating higher Cash from operating activities.

Human Capital

The average number of people employed by PPG during 2023 was approximately 53,000, of which approximately 16,300 were in the United States and approximately 36,700 were elsewhere in the world. The Company has numerous collective bargaining agreements throughout the world. We observe local customs, laws and practices in labor relations when negotiating collective bargaining agreements. There were no significant work stoppages in 2023. While we have experienced occasional work stoppages and may experience some work stoppages in the future, we believe that we will be able to negotiate all labor agreements on satisfactory terms. To date, these work stoppages have not had a significant impact on our results of operations. Overall, we believe we have good relationships with our employees.

The PPG Way is a set of behaviors that enables, empowers and engages each employee to fully live our values and realize our full potential as an organization. It guides our employees and leaders as we strive to achieve our purpose of protecting and beautifying the world. Employee engagement is a measure of the extent to which our employees are involved in, enthusiastic about, and committed to our work and workplace. We conduct employee surveys to increase dialogue among teams and implement meaningful action to improve results.

Our human capital management strategies provide the foundation for our teams to thrive and deliver exceptional performance. These strategies in the areas of culture and purpose, employee engagement, development and pay equity are overseen by the Human Capital Management and Compensation Committee of our Board of Directors. We are committed to ensuring our employees are safe, healthy, enabled, engaged and valued for the diverse talents they bring to PPG. We believe that having quality dialogue with our people, recognizing the value they bring and championing an authentic culture generates engaged employees and a company that is more innovative, productive and competitive. Our focus on and investment in learning and development are crucial to ensuring we keep our people engaged, productive and successful at every stage of their careers. We are committed to promoting from within wherever possible while also bringing in new ideas, thoughts and insights.

Our environmental, health and safety policy and standards define our expectations, and we implement programs and initiatives to reduce health and safety risk in our operations. We measure progress against our health and safety goals using the injury and illness rate, which is calculated as the number of illness and injury incidents per 200,000 work hours. For 2023, our injury and illness rate was 0.32.

One of PPG's greatest strengths is the diversity of our people, who represent wide-ranging nationalities, cultures, languages, religions, ethnicities, and professional and educational backgrounds. Their unique perspectives enable us to meet challenges quickly, creatively and effectively, providing a significant competitive advantage in today's global economy. To ensure our people feel valued and respected, we are committed to providing a workplace that embraces a culture of diversity and inclusion and is free from harassment and bullying. In connection with our focus on diversity, equity and inclusion, PPG operates eight Employee Resource Networks ("ERNs"). These ERNs are open to all employees and are intended to provide an opportunity for in-depth discussion, focus and recommendations on how PPG can deliver higher growth and performance by creating a more diverse, equitable and inclusive organization.

More information about PPG's human capital management strategies and our workforce can be found in the Proxy Statement for our 2024 Annual Meeting of Shareholders and in our ESG Report located at <http://sustainability.ppg.com>.

Environmental Matters

PPG is committed to operating in a sustainable and productive manner and to helping our customers meet their sustainability goals. Our sustainability efforts are overseen by the Sustainability and Innovation Committee of our Board of Directors. At the management level, day-to-day implementation of our environmental, social and governance ("ESG") initiatives is led by our Vice President, Global Sustainability, who is responsible for coordinating PPG's ESG and sustainability programs and for communicating our ESG progress with our customers, shareholders and other stakeholders. The Vice President, Global Sustainability works with PPG's Sustainability Committee, a committee of management consisting of senior corporate executives, to establish and monitor our sustainability goals, policies, programs and procedures that incorporate sustainability into our business practices, including resource management, climate change impacts, innovation, community engagement, communications, procurement, manufacturing and employee wellness.

Our dedication to innovation is intertwined with sustainability. We are marketing an ever-growing variety of products and services that protect the environment and provide safety and other benefits to our customers. Our products contribute to lighter, more fuel-efficient vehicles, airplanes and ships, and they help our customers reduce their energy consumption, conserve water and reduce waste. These products include compact automotive paint processes and low temperature cure capabilities that save energy and reduce water usage at customer manufacturing sites; sustainably-advantaged waterborne coatings formulations; sustainably-advantaged powder coatings; lightweight sealants and coatings for aircraft; coatings that cool surfaces; coatings for recyclable metal packaging; antimicrobial products; coatings that contain reduced materials of concern; architectural coatings that contain lower carbon content raw materials; silica products for tires that improve vehicle fuel economy; and solutions for autonomous and battery-powered vehicles. For the year ended December 31, 2023, 44% of sales were from sustainably-advantaged products and processes that we have defined as addressing multiple sustainability benefits, including lower emissions, lower toxicity, energy efficiency, use of renewable raw materials or extending durability.

PPG is committed to using resources efficiently and driving sustainability throughout our entire value chain, including continued focus on reducing greenhouse gas emissions, water withdrawal and total energy use. During 2023, PPG announced its near-term 2030 sustainability goals, including greenhouse gas ("GHG") emissions targets that have been validated by the Science Based Targets initiative. PPG's 2030 sustainability goals include a commitment to reduce absolute emissions from its own operations (scope 1 and 2) by 50% by 2030 from a 2019 base year and to reduce absolute scope 3 GHG emissions from purchased goods and services, processing of sold products, and end-of-life treatment of sold products by 30% within the same timeframe. More information about PPG's sustainability values, efforts, goals and data and our community and employee engagement programs can be found in our ESG Report located at <http://sustainability.ppg.com>.

We are subject to existing and evolving standards relating to the protection of the environment. In management's opinion, the Company operates in an environmentally sound manner and is well positioned, relative to environmental matters, within the industries in which it operates. PPG is negotiating with various government agencies concerning current and former manufacturing sites and offsite waste disposal locations, including certain sites on the National Priority List. While PPG is not generally a major contributor of wastes to these offsite waste disposal locations, each potentially responsible party may face governmental agency assertions of joint and several liability. Generally, however, a final allocation of costs is made based on relative contributions of wastes to the site. There is a wide range of cost estimates for cleanup of these sites, due largely to uncertainties as to the nature and extent of their condition and the methods that may have to be employed for their remediation. The Company has established reserves for onsite and offsite remediation of those sites where it is probable that a liability has been incurred and the amount of loss can be reasonably estimated.

Our experience to date regarding environmental matters leads us to believe that we will have continuing expenditures for compliance with provisions regulating the protection of the environment and for present and future remediation efforts at waste and plant sites. Management anticipates that such expenditures will occur over an extended period of time.

In addition to the \$227 million currently reserved for environmental remediation efforts, we may be subject to loss contingencies related to environmental matters estimated to be approximately \$100 million to \$200 million. These reasonably possible unreserved losses relate to environmental matters at a number of sites, none of which are individually significant. The loss contingencies related to these sites include significant unresolved issues such as the nature and extent of contamination at these sites and the methods that may have to be employed to remediate them.

<i>(\$ in millions)</i>	2023	2022	2021
Capital expenditures for environmental control projects	\$26	\$22	\$17

We believe that capital expenditures for environmental control projects will be slightly higher in 2024 compared to 2023. Actual future capital expenditures may differ from expectations due to the inherent uncertainties involved in estimating future environmental remediation compliance costs, including possible technological, regulatory and enforcement developments, the results of environmental studies and other factors.

Management believes that the outcome of these environmental contingencies will not have a material adverse effect on PPG's financial position or liquidity; however, any such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized. Refer to Note 15, "Commitments and Contingent Liabilities" in Item 8 of this Form 10-K for additional information related to environmental matters and our accrued liability for estimated environmental remediation costs.

Available Information

The Company's website address is www.ppg.com. The Company posts, and shareholders may access without charge, the Company's recent filings and any amendments of its annual reports on Form 10-K, quarterly reports on Form 10-Q and its proxy statements as soon as reasonably practicable after such reports are filed with the Securities and Exchange Commission ("SEC"). The Company also posts all financial press releases, including earnings releases, and all other reports filed or furnished to the SEC, including current reports on Form 8-K to its website. Reference to the Company's, the SEC's or other websites herein does not incorporate by reference any information contained on those websites, and such information should not be considered part of this Form 10-K.

Item 1A. Risk Factors

As a global manufacturer of paints, coatings and specialty materials, we operate in a business environment that includes risks. Each of the risks described in this section could adversely affect our results of operations, financial position and liquidity. While the factors listed here are considered to be the more significant factors, no such list should be considered to be a complete statement of all potential risks and uncertainties. Unlisted factors may present significant additional obstacles which may adversely affect our businesses and our results of operations, financial position and liquidity.

Economic Risks

Increases in prices and declines in the availability of raw materials could negatively impact our financial results.

Our financial results are significantly affected by the cost of raw materials. Raw materials include both organic, primarily petroleum-derived, materials and inorganic materials, including titanium dioxide. These raw materials represent PPG's single largest production cost component. Most of our raw materials are purchased from outside sources, and the Company has made, and plans to continue to make, supply arrangements to meet the planned operating requirements for the future. Adequate supply of critical raw materials is managed by establishing contracts, procuring from multiple sources, and identifying alternative materials or technology whenever possible. While not our customary practice, we also import raw materials and intermediates, particularly for use at our manufacturing facilities in the emerging regions of the world. In most cases, those imports are priced in the currency of the supplier and, therefore, if that currency strengthens against the currency of our manufacturing facility, our margins may be lower.

The Company is continuing its aggressive sourcing initiatives to effectively broaden our supply of high quality raw materials. These initiatives include qualifying multiple and local sources of supply, within Asia and other lower cost regions of the world, diversification of our resin supply, including adding on-site resin production at certain manufacturing locations, and a reduction in the amount of titanium dioxide and certain other raw materials used in our product formulations.

PPG continues to undertake actions to maintain supply arrangements adequate to meet planned operating requirements. However, raw material supply chain disruptions, including logistical and transportation challenges, could adversely impact our ability to procure raw materials. An inability to obtain certain critical raw materials has adversely impacted our ability to produce certain products in the past and could do so in the future. If raw material costs increase and we are unable to offset these higher costs in a timely manner, this would adversely impact Income from continuing operations and Cash from operating activities.

The pace of economic growth and level of economic and geopolitical uncertainty could have a negative impact on our results of operations and cash flows.

Demand for our products and services depends, in part, on the general economic conditions affecting the countries and markets in which we do business. Weak economic conditions in certain geographies and changing supply and demand balances in the markets we serve have negatively impacted demand for our products and services in the past and may do so in the future. There is a high level of uncertainty surrounding future global economic conditions due to a number of factors, including the impact of higher interest rates, geopolitical uncertainty, including the international impacts of the ongoing wars in Ukraine and Israel and increasing tensions between China and the United States, commodity market volatility, potential changes to international trade agreements, the imposition of tariffs and the threat of additional tariffs, and labor shortages in certain regions of the world. PPG provides products and services to a variety of end-use markets in many geographies. This broad end-use market exposure and expanded geographic presence lessens the significance of any individual decrease in activity levels; nonetheless, lower demand levels may result in lower sales, which would adversely impact Income from continuing operations and Cash from operating activities.

Fluctuations in foreign currency exchange rates could affect our financial results.

We are exposed to foreign currency exchange rate risk with respect to our sales, expenses, profits, assets and liabilities denominated in currencies other than the U.S. dollar. Because our consolidated financial statements are presented in U.S. dollars, we must translate revenues and expenses into U.S. dollars at the average exchange rate during each reporting period, as well as assets and liabilities into U.S. dollars at exchange rates in effect at the end of each reporting period. Therefore, increases or decreases in the value of the U.S. dollar against other currencies will affect our Net sales, Net income and the value of balance sheet items denominated in foreign currencies. We may use derivative financial instruments to reduce our net exposure to currency exchange rate fluctuations related to foreign currency transactions. However, fluctuations in foreign currency exchange rates, particularly the strengthening or weakening of the U.S. dollar against major currencies, could adversely or positively affect our financial condition and results of operations which are expressed in U.S. dollars.

The industries in which we operate are highly competitive.

With each of our businesses, an increase in competition may cause us to lose market share or lose customers, adversely impacting our sales volumes, or compel us to reduce prices to remain competitive, which could result in reduced margins for our products. Additionally, our ability to increase prices may impact the overall economics for the products we offer. Competitive pressures may not only reduce our margins but may also impact our revenues and our growth which could adversely affect our results of operations.

Public health crises, including pandemics and the measures taken by public health and government authorities to address them, have adversely impacted and could continue to adversely impact our financial condition and results of operations.

Our financial condition, liquidity and results of operations were adversely affected by the COVID-19 pandemic, including impacts from efforts by public health officials to mitigate the spread of COVID-19. The effects of this public health crisis interfered with the ability of PPG, our suppliers, our customers, and others to conduct business and negatively affected consumer confidence and the global economy. Preventative and protective actions taken by public health officials, governments and PPG with respect to the public health crises have and may continue to adversely impact our business, suppliers, distribution channels, and customers, including business shutdowns, reduced workforce availability, reduced ability to supply products, or reduced demand for our products. While we cannot reasonably predict the duration or scope of current and future public health crises, our results of operations, financial position and liquidity have been and may continue to be adversely impacted by the COVID-19 pandemic or any other future health-related crises.

Legal, Regulatory, and Tax Risks

We are subject to existing and evolving standards relating to the protection of the environment.

Environmental laws and regulations control, among other things, the discharge of pollutants into the air and water, the handling, use, treatment, storage and clean-up of hazardous and non-hazardous waste, and the investigation and remediation of soil and groundwater affected by hazardous substances. In addition, various laws regulate health and safety matters. The environmental laws and regulations we are subject to impose liability for the costs of, and damages resulting from, cleaning up current sites, past spills, disposals and other releases of hazardous substances. Violations of these laws and regulations can also result in fines and penalties. Future environmental laws and regulations, including rules requiring expanded reporting of certain environmental, safety and governance information, may require substantial capital expenditures or may require or cause us to modify or curtail our operations, which may have a material adverse impact on our business, financial condition and results of operations.

We are involved in a number of lawsuits and claims, and we may be involved in future lawsuits and claims, in which substantial monetary damages are sought.

PPG is involved in a number of lawsuits and claims, both actual and potential, in which substantial monetary damages are sought. Those lawsuits and claims may relate to contract, patent, environmental, product liability, asbestos exposure, antitrust, employment, securities and other matters arising out of the conduct of PPG's current and past business activities. Any such claims, whether with or without merit, could be time consuming and expensive to defend and could divert management's attention and resources. We maintain insurance against some, but not all, of these potential claims, and the levels of insurance we maintain may not be adequate to fully cover any and all losses. We believe that, in the aggregate, the outcome of all current lawsuits and claims involving PPG, including those described in Note 15, "Commitments and Contingent Liabilities" in Item 8 of this Form 10-K, will not have a material effect on PPG's consolidated financial position or liquidity; however, such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized. Nonetheless, the results of any future litigation or claims are inherently unpredictable, and such outcomes could have a material adverse effect on our results of operations, Cash from operating activities or financial condition.

We are subject to a variety of laws and regulations, which could increase our compliance costs and could adversely affect our results of operations.

We are subject to a wide variety of complex U.S. and non-U.S. laws and regulations, and legal compliance risks, including securities laws, tax laws, environmental laws, employment and pension-related laws, competition laws, U.S. and foreign export and trading laws, and laws governing improper business practices, including bribery. We are affected by new laws and regulations and changes to existing laws and regulations, as well as interpretations by courts and regulators. These laws and regulations effectively expand our compliance obligations and costs.

For example, regulations concerning the composition, use and transport of chemical products continue to evolve. Developments concerning these regulations could potentially impact the availability or viability of some of the raw materials we use in our product formulations and/or our ability to supply certain products to some customers or markets. Import/export sanctions and regulations also continue to evolve and could result in increased compliance costs, slower product movements or additional complexity in our supply chains.

Further, although we believe that we have appropriate risk management and compliance programs in place, we cannot guarantee that our internal controls and compliance systems will always protect us from improper acts committed by employees, agents, business partners or businesses that we acquire. Any non-compliance or such improper actions or allegations could damage our reputation and subject us to civil or criminal investigations and shareholder lawsuits, could lead to substantial civil and criminal, monetary and non-monetary penalties, and could cause us to incur significant legal and investigatory costs.

Changes in the tax regimes and related government policies and regulations in the countries in which we operate could adversely affect our results and our effective tax rate.

As a multinational corporation, we are subject to various taxes in both the U.S. and non-U.S. jurisdictions. Due to economic and political conditions, tax rates in these various jurisdictions may be subject to significant changes. For example, the Organisation for Economic Co-operation and Development has proposed modernizing international tax rules, including global minimum tax standards, which could cause an increase to our effective tax rate or result in higher cash tax liabilities. Our effective income tax rate is also affected by changes in the mix of earnings in countries with differing statutory tax rates, changes in the valuation of deferred tax assets, the introduction of new taxes and changes in tax laws or their interpretation. If our effective income tax rate were to increase, our Cash from operating activities, financial condition and results of operations would be adversely affected. Although we believe that our tax filing positions are appropriate, the final determination of tax audits or tax disputes may be different from what is reflected in our historical income tax provisions and accruals. If future audits find that additional taxes are due, we may be subject to incremental tax liabilities, possibly including interest and penalties, which could have a material adverse effect on our Cash from operating activities, financial condition and results of operations.

Operational and Strategic Risks

Our international operations expose us to additional risks and uncertainties that could affect our financial results.

PPG has a significant investment in global operations. This broad geographic footprint serves to lessen the significance of economic impacts occurring in any one region. Notwithstanding the benefits of geographic diversification, our ability to achieve and maintain profitable growth in international markets is subject to risks related to the differing legal, political, social and regulatory requirements and economic conditions of many countries. As a result of our operations outside the U.S., we are subject to certain inherent risks, including political and economic uncertainty, inflation rates, exchange rates, trade protection measures, local labor conditions and laws, restrictions on foreign investments and repatriation of

earnings, and weak intellectual property protection. Recently, there has been an increase in global geopolitical uncertainty due to a number of factors, including the international impacts of the ongoing wars in Ukraine and Israel and increasing tensions between China and the United States. During 2023, approximately 63% of the Company's total net sales were recognized outside of the United States.

Business disruptions could have a negative impact on our results of operations and financial condition.

Unexpected events, including supply disruptions, temporary plant and/or power outages, work stoppages, natural disasters and severe weather events, including those potentially due to climate change, significant public health issues, computer system disruptions, challenges implementing, upgrading or transitioning enterprise resource planning systems, fires, war or terrorist activities, could increase the cost of doing business or otherwise harm the operations of PPG, our customers and our suppliers. It is not possible for us to predict the occurrence or consequence of any such events. However, such events could reduce our ability to supply products, reduce demand for our products or make it difficult or impossible for us to receive raw materials from suppliers or to deliver products to customers.

The security of our information technology systems could be compromised which could adversely affect our operations or reputation.

We rely extensively on global information technology systems, networks and services, certain of which are managed, hosted, provided and/or used by third parties or their vendors, to conduct our business. We use information technology systems, networks, and services throughout many of our key business processes, including, but not limited to, receiving customer orders, purchasing materials, producing inventory, shipping inventory to customers, collecting customer payments, and paying our employees and vendors.

Numerous and evolving information security threats, including advanced persistent threats and ransomware, pose a risk to the security of our systems, networks and services, as well as to the confidentiality, availability and integrity of our data and of our critical business operations. In addition, because the techniques, tools and tactics used in cyber-attacks frequently change and may be difficult to detect for periods of time, we may face difficulties in anticipating and implementing adequate preventative measures or fully mitigating harms after such an attack. Our information technology systems, networks and services have been, and will likely continue to be, subject to cybersecurity attacks. We have implemented and operate a cybersecurity program designed to protect and preserve the confidentiality, integrity and availability of our networks and systems as well as information that we own or is in our care. Notwithstanding our cybersecurity preparedness activities, we cannot guarantee that our security efforts or the security efforts of our third-party service providers will prevent all cybersecurity events. A material cybersecurity event could result in negative publicity, theft or other financial loss, modification or destruction of proprietary information or key information, manufacture of defective products, theft of personally identifiable information, and/or production downtimes and operational disruptions, which could adversely affect our results of operations.

We may not effectively integrate acquired businesses into our existing operations.

Growth through acquisitions is an important component of the Company's strategy. Over the last decade, we have successfully completed more than 50 acquisitions, and we will likely acquire additional businesses and enter into additional joint ventures in the future. Growth through acquisitions and the formation of joint ventures involve risks, including:

- difficulties in assimilating acquired companies and products into our existing business;
- delays in realizing the benefits from the acquired companies or products;
- diversion of our management's time and attention from other business concerns;
- difficulties due to lack of or limited prior experience in any new markets we may enter;
- unforeseen claims and liabilities, including unexpected environmental exposures, product liability, or existing information technology vulnerabilities;
- unexpected losses of customers or suppliers of the acquired or existing business;
- difficulty in conforming the acquired business' standards, processes, procedures and controls to those of our operations; and
- difficulties in retaining key employees of the acquired businesses.

These risks or other challenges encountered in connection with our past or future acquisitions and joint ventures could cause delays in realizing the anticipated benefits of such acquisitions or joint ventures, or such anticipated benefits may never be realized, which could adversely affect our results of operations, Cash from operating activities or financial condition.

Our ability to understand our customers' specific preferences and requirements, and to innovate, develop, produce and market products that meet customer demand is critical to our business results.

Our business relies on continued global demand for our brands and products. To achieve our business goals, we must develop and sell products that appeal to customers. This is dependent on a number of factors, including our ability to produce products that meet the quality, performance and price expectations of our customers and our ability to develop effective sales, advertising and marketing programs.

We believe the automotive industry will experience significant and continued change in the coming years, including an increase in the production of electric vehicles. Vehicle manufacturers continue to develop new safety features such as collision avoidance technology and self-driving vehicles that may reduce vehicle collisions in the future, potentially lowering demand for our automotive refinish coatings. In addition, through the introduction of new technologies, new business models or new methods of travel, such as ridesharing, the number of automotive OEM new-builds may decline, potentially reducing demand for our automotive OEM coatings and related automotive parts.

Additionally, the development of customer-facing digital channels has and will continue to transform certain retail industries. An inability to develop such solutions and our customer's pace of adoption of those solutions could negatively affect our business or the market demand for our products. We manage our innovation pipeline and introduction of new products through a rigorous stage gate process. We continuously look at ways to optimize and improve the effectiveness of this process to deliver innovation and growth.

Our future growth will depend on our ability to continue to innovate our existing products and to develop and introduce new products. If we fail to keep pace with product innovation on a competitive basis or to predict market demands for our products, our businesses, financial condition and results of operations could be adversely affected.

Our business success depends on attracting, developing and retaining a qualified workforce.

Our continued business success depends on the efforts and abilities of our management team and employees. The skills, experience and industry knowledge of our employees significantly benefit our operations and performance. We compete with other companies both within and outside of our industry for talented personnel in a highly competitive labor market, and we may face challenges attracting or retaining qualified employees. If we are unable to effectively attract, develop and retain a qualified workforce, our businesses, financial condition and results of operations could be adversely affected.

Item 1B. Unresolved Staff Comments

None.

Item 1C. Cybersecurity

PPG's cybersecurity program is designed to protect and preserve the confidentiality, integrity and availability of our networks and systems as well as information that we own or is in our care through a risk-based approach. The Company's program is based on the U.S. National Institute for Standards and Technology (NIST) cybersecurity framework and other applicable industry frameworks.

Our cybersecurity program includes:

- ongoing employee cybersecurity awareness and training activities, which include frequent phishing testing;
- access management and access controls intended to implement Principle of Least Privilege (PoLP) access;
- protection of certain data through encryption at rest and in transit;
- monitoring and protection software;
- a vulnerability management program that includes managing the risk of third-party software;
- a cyber incident response plan that provides controls and procedures to support appropriate containment, response, investigation, reporting and recovery of cybersecurity incidents;
- periodic testing of our cybersecurity posture, including by independent third-party consultants; and
- integrating cybersecurity requirements and other provision into various contracts.

PPG has continued to invest in cybersecurity to evolve and improve its program. PPG regularly assesses and measures itself against industry practices to identify opportunities to improve its people, processes and technology used to identify, prevent, detect, respond and recover from cybersecurity incidents. When such improvements are identified and validated as appropriate in PPG's business context, they are incorporated in the roadmap for implementation.

To date, the risks from cybersecurity threats have not materially affected the Company. We have significantly increased our cybersecurity investments over the last five years and have implemented cybersecurity safeguards designed to detect

and prevent cybersecurity events that may have a material adverse effect on the Company. Notwithstanding our increased cybersecurity investments and preparedness activities, sophisticated and targeted computer crime perpetrated by threat actors internal or external to the Company poses a risk to the security of our systems, facilities, and networks and to the confidentiality, availability and integrity of our data, including but not limited to intellectual property and confidential and personal data. This could lead to negative publicity, theft or other financial loss, modification or destruction of proprietary information or key information, manufacture of defective products, production downtimes and operational disruptions, which could materially and adversely affect our reputation, competitiveness and results of operations. Refer to the risk factor titled “*The security of our information technology systems could be compromised which could adversely affect our operations or reputations*” in Item 1A of this Form 10-K for further detail regarding cybersecurity risks that could affect PPG’s operations. We maintain insurance covering certain costs that we may incur in connection with cybersecurity incidents, which we believe is commensurate with the size and the nature of our operations. However, the Company may incur expenses and losses related to a cyber incident that are not covered by insurance or are in excess of our insurance coverage.

The PPG Board of Directors (the “Board”) has overall responsibility for the oversight of risk management at PPG, which includes cybersecurity risks. The Audit Committee of the Board (the “Audit Committee”), is responsible for oversight of the Company’s enterprise risk management (“ERM”) program which provides oversight and governance of all of the Company’s operational and financial risks including risks from cybersecurity threats to the Company. The Audit Committee receives bi-annual reports and periodic briefings on cybersecurity matters, including key risks to the Company, recent developments, and risk mitigation activities from our Vice President and Chief Information Officer (“CIO”) and our Chief Information Security Officer (“CISO”), who are both responsible for overseeing our cybersecurity program. In addition, the full Board receives bi-annual briefings from our CIO on our cybersecurity program. The Board and the Audit Committee also periodically review the results of exercises performed by our advisors as part of an independent assessment of PPG’s cybersecurity program and internal preparedness.

In addition, the Enterprise Risk Committee, a committee of senior executives who identify and monitor the risks to PPG and are responsible for our ERM program, receives updated information on cybersecurity risks at each of its meetings.

As part of their oversight of our cybersecurity program, our CIO and our CISO oversee a team of cybersecurity professionals and are responsible for assessing and managing our material risks from cybersecurity threats. Our CIO and CISO are trained information technology professionals, each of whom has earned degrees in information systems and business administration and has many years of experience in or managing global enterprise information technology at various organizations.

PPG maintains an internal communication hierarchy that is designed to communicate the occurrence of certain cybersecurity events and/or incidents into our systems to our CISO, our CIO, our company crisis response team, and, as appropriate, to certain members of senior management. This communication hierarchy includes protocols for informing the Audit Committee and the full Board of certain cybersecurity events and/or incidents and for determining the materiality thereof.

Item 2. Properties

PPG’s corporate headquarters is located in the United States in Pittsburgh, Pa. The Company’s manufacturing facilities, sales offices, research and development centers and distribution centers are located throughout the world. Refer to Item 1. “Business” of this Form 10-K for the principal manufacturing and distribution facilities by reportable business segment.

The Company’s principal research and development centers are located in Allison Park, Pa.; Tianjin, China; Cleveland, Oh.; Springdale, Pa.; Milan, Italy; Monroeville, Pa.; Harmar, Pa.; Ingersheim, Germany; Marly, France; Oak Creek, Wi.; Sumare, Brazil; Amsterdam, Netherlands; Vantaa, Finland; Tepexpan, Mexico; Burbank, Ca.; Zhangjiagang, China; Cheonan, Republic of Korea; Wroclaw, Poland; Bangplee, Thailand; and Sylmar, Ca.

Our headquarters, certain distribution centers and substantially all company-owned paint stores are located in facilities that are leased while our other facilities are generally owned. Our facilities are considered to be suitable and adequate for the purposes for which they are intended and overall have sufficient capacity to conduct business in the upcoming year.

Item 3. Legal Proceedings

PPG is involved in a number of lawsuits and claims, both actual and potential, including some that it has asserted against others, in which substantial monetary damages are sought. These lawsuits and claims may relate to contract, patent, environmental, product liability, asbestos exposure, antitrust, employment, securities and other matters arising out of the conduct of PPG’s current and past business activities. To the extent these lawsuits and claims involve personal injury, property damage and certain other claims, PPG believes it has adequate insurance; however, certain of PPG’s insurers are contesting coverage with respect to some of these claims, and other insurers may contest coverage. PPG’s lawsuits and claims against others include claims against insurers and other third parties with respect to actual and contingent losses related to environmental, asbestos and other matters.

From the late 1880's until the early 1970's, PPG owned property located in Cadogan and North Buffalo Townships, Pennsylvania which was used for the disposal of solid waste from PPG's former glass manufacturing facility in Ford City, Pennsylvania. In October 2018, the Pennsylvania Department of Environmental Protection (the "DEP") approved PPG's cleanup plan for the Cadogan Property. In April 2019, PPG and the DEP entered into a consent order and agreement ("CO&A") which incorporated PPG's approved cleanup plan and a draft final permit for the collection and discharge of seeps emanating from the former disposal area. The CO&A includes a civil penalty of \$1.2 million for alleged past unauthorized discharges. PPG's former disposal area is also the subject of a citizens' suit filed by the Sierra Club and PennEnvironment seeking remedial measures beyond the measures specified in PPG's approved cleanup plan, a civil penalty in addition to the penalty included in the CO&A and plaintiffs' attorneys fees. PPG and the plaintiffs settled plaintiffs' claims for injunctive relief and PPG agreed to enhancements to the DEP approved cleanup plan and a \$250,000 donation to a Pennsylvania nonprofit organization. This settlement has been memorialized by an amendment to the CO&A which was appended to a Consent Agreement between PPG and the plaintiffs which has been entered by the federal Court. The remaining claims in the case for attorneys' fees and a civil penalty are not affected by this settlement. PPG believes that the remaining claims are without merit and intends to defend itself against these claims vigorously.

For many years, PPG has been a defendant in lawsuits involving claims alleging personal injury from exposure to asbestos. For a description of asbestos litigation affecting the Company, see Note 15, "Commitments and Contingent Liabilities" to the accompanying consolidated financial statements in Part I, Item 8 of this Form 10-K.

In the past, the Company and others have been named as defendants in several cases in various jurisdictions claiming damages related to exposure to lead and remediation of lead-based coatings applications. PPG has been dismissed as a defendant from most of these lawsuits and has never been found liable in any of these cases. After having not been named in a new lead-related lawsuit for 15 years, PPG was named as a defendant in two Pennsylvania state court lawsuits filed by Montgomery County and Lehigh County in the respective counties on October 4, 2018 and October 12, 2018. Both suits sought declaratory relief arising out of alleged public nuisances in the counties associated with the presence of lead paint on various buildings constructed prior to 1980. By Opinion and Order dated May 5, 2023, the Pennsylvania Commonwealth Court reversed rulings of the lower trial courts, unanimously ruling that the Counties failed to plead valid causes of action, and remanding both cases to their respective trial courts for dismissal. On June 5, 2023, the Counties filed Petitions for Allowance of Appeal with the Pennsylvania Supreme Court. On November 20, 2023, the Pennsylvania Supreme Court denied the Counties' Petitions and, as such, dismissal of the lawsuit is now final.

Information About Our Executive Officers

Set forth below is information related to the Company's executive officers as of February 15, 2024.

<i>Name</i>	<i>Age</i>	<i>Title</i>
Timothy M. Knavish ^(a)	58	Chairman and Chief Executive Officer since October 2023
Anne M. Foulkes ^(b)	61	Senior Vice President and General Counsel since September 2018
Vincent J. Morales ^(c)	58	Senior Vice President and Chief Financial Officer since March 2017
K. Henrik Bergström ^(d)	51	Senior Vice President, Architectural Coatings, Latin America, EMEA and Asia Pacific since May 2023
Kevin D. Braun ^(e)	55	Senior Vice President, Industrial Coatings Segment since May 2023
Amy R. Ericson ^(f)	58	Senior Vice President, Protective and Marine Coatings since January 2023
Chancey E. Hagerty ^(g)	50	Senior Vice President, Automotive Refinish Coatings since May 2023
Ramaprasad Vadlamannati ^(h)	61	Senior Vice President, Operations since January 2023

- (a) On September 26, 2023, Mr. Knavish was elected Chairman and Chief Executive Officer, effective October 1, 2023. Mr. Knavish served as President and Chief Executive Officer from January 1, 2023 until September 30, 2023. Mr. Knavish served as Chief Operating Officer from March 2022 through December 2022. He previously served as Executive Vice President from October 2019 through February 2022, Senior Vice President, Architectural Coatings and President, PPG EMEA from January 2019 through September 2019, Senior Vice President, Industrial Coatings from October 2017 through December 2018, Senior Vice President, Automotive Coatings from March 2016 through September 2017, Vice President, Protective and Marine Coatings from August 2012 through February 2016 and Vice President, Automotive Coatings, Americas from March 2010 through July 2012.
- (b) Ms. Foulkes served as Senior Vice President, General Counsel and Secretary from April 2022 to June 2022 and from August 2018 to September 2018, Vice President and Associate General Counsel and Secretary from March 2016 through July 2018 and Assistant General Counsel and Secretary from April 2011 through February 2016.
- (c) Mr. Morales served as Vice President, Finance from June 2016 through February 2017. From June 2015 through June 2016, he served as Vice President, Investor Relations and Treasurer and from October 2007 through May 2015 he served as Vice President, Investor Relations.
- (d) Effective May 1, 2023, Mr. Bergström was named Senior Vice President, Architectural Coatings, Latin America, EMEA and Asia Pacific. Mr. Bergström served as Vice President, Architectural Coatings, Latin America, EMEA and Asia Pacific from February 2022 through April 2023 and as Vice President Architectural Coatings, Latin America from April 2017 through January 2022.
- (e) Effective May 1, 2023, Mr. Braun was named Senior Vice President, Industrial Coatings Segment. Mr. Braun served as Vice President, Global Industrial Coatings from January 2020 through April 2023 and as Vice President, Industrial Coatings, Americas from September 2013 through December 2019.
- (f) Ms. Ericson served as Senior Vice President, Packaging Coatings from July 2018 through December 2022. She served as President of SUEZ Chemical Monitoring and Solutions from 2017 until 2018, President of General Electric Water Services Company from 2015 to 2017 and President and Chief Executive Officer of Alstom SA's U.S. business from 2013 to 2015.
- (g) Effective May 1, 2023, Mr. Hagerty was named Senior Vice President, Automotive Refinish Coatings. Mr. Hagerty served as Vice President, Global Automotive Refinish Coatings from January 2020 through April 2023 and as Vice President, Global Industrial Coatings from January 2019 through December 2019.
- (h) Mr. Vadlamannati served as Senior Vice President, Protective and Marine Coatings and President PPG EMEA from October 2019 through December 2022, Senior Vice President, Protective and Marine Coatings from March 2016 through September 2019, Vice President, Architectural Coatings, EMEA and Asia Pacific from August 2014 through February 2016, Vice President, Architectural Coatings, EMEA from February 2012 through July 2014, Vice President, Architectural Coatings, EMEA for Region Western Europe from March 2011 through January 2012 and Vice President, Automotive Refinish, EMEA from September 2010 through February 2011.

Item 4. Mine Safety Disclosures

Not Applicable.

Part II

Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

The information required by Item 5 regarding market information, including PPG's stock exchange listing and quarterly stock market prices, dividends, holders of common stock, and the stock performance graph is included in Exhibit 13.1 filed with this Form 10-K and is incorporated herein by reference.

Issuer Purchases of Equity Securities - Fourth Quarter 2023

Month	Total Number of Shares Purchased	Avg. Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Programs	Max. Number of Shares That May Yet Be Purchased Under the Programs ⁽¹⁾
October 2023				
Repurchase program	—	\$—	—	9,043,759
November 2023				
Repurchase program	—	\$—	—	7,819,581
December 2023				
Repurchase program	673,638	\$148.61	673,638	6,754,871
Total quarter ended December 31, 2023				
Repurchase program	673,638	\$148.61	673,638	6,754,871

(1) In December 2017, PPG's board of directors approved a \$2.5 billion share repurchase program. The remaining shares yet to be purchased under the program has been calculated using PPG's closing stock price on the last business day of the respective month. This repurchase program has no expiration date.

Item 6. [Reserved]

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion includes a comparison of our results of operations and liquidity and capital resources for the years ended December 31, 2023 and 2022. A discussion of changes in our results of operations for the year ended December 31, 2022 as compared to the year ended December 31, 2021 has been omitted from this Form 10-K, but may be found in "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" of our 2022 Form 10-K, filed with the Securities and Exchange Commission on February 16, 2023.

Highlights

Net sales were approximately \$18.2 billion in 2023, an increase of 3% compared to the prior year, driven by higher selling prices resulting from continued selling price initiatives. The Company increased net sales led by growth in aerospace coatings and automotive OEM coatings despite lower global industrial production and soft demand conditions in Europe.

Income before income taxes was \$1,748 million in 2023, an increase of \$367 million compared to the prior year. This increase was primarily due to higher selling prices and lower raw material costs, partially offset by higher selling, general and administrative expense and lower sales volumes.

Performance Overview

Net Sales by Region

			% Change
(\$ in millions, except percentages)	2023	2022	2023 vs. 2022
United States and Canada	\$7,488	\$7,383	1.4%
Europe, Middle East and Africa (EMEA)	5,616	5,458	2.9%
Asia Pacific	2,874	2,824	1.8%
Latin America	2,268	1,987	14.1%
Total	\$18,246	\$17,652	3.4%

Net sales increased \$594 million due to the following:

- Higher selling prices (+5%)

Partially offset by:

- Lower sales volumes (-2%)

For specific business results, see the Performance of Reportable Business Segments section within Item 7 of this Form 10-K.

Cost of sales, exclusive of depreciation and amortization

	% Change		
(\$ in millions, except percentages)	2023	2022	2023 vs. 2022
Cost of sales, exclusive of depreciation and amortization	\$10,745	\$11,096	(3.2)%
Cost of sales as a % of net sales	58.9%	62.9%	(4.0)%

Cost of sales, exclusive of depreciation and amortization, decreased \$351 million due to the following:

- Moderating raw material costs
- Lower sales volume

Partially offset by:

- Wage and other cost inflation

Selling, general and administrative expenses

	% Change		
(\$ in millions, except percentages)	2023	2022	2023 vs. 2022
Selling, general and administrative expenses	\$4,222	\$3,842	9.9%
Selling, general and administrative expenses as a % of net sales	23.1%	21.8%	1.3%

Selling, general and administrative expenses increased \$380 million primarily due to:

- Wage and other cost inflation
- Unfavorable foreign currency translation
- Higher performance-based compensation expense
- Selling, general and administrative expenses from acquired businesses

Partially offset by:

- Restructuring cost savings

Other charges and other income

	% Change		
(\$ in millions, except percentages)	2023	2022	2023 vs. 2022
Interest expense	\$247	\$167	47.9%
Interest income	(\$140)	(\$54)	159.3%
Impairment and other related charges, net	\$160	\$245	(34.7)%
Pension settlement charge	\$190	\$—	N/A
Other charges/(income), net	\$83	(\$27)	(407.4)%

Interest expense

Interest expense increased \$80 million 2023 versus 2022 primarily due to the unfavorable impact of higher interest rates on PPG's variable rate debt obligations.

Interest income

Interest income increased \$86 million primarily due to strong cash generation, resulting in higher levels of cash and cash equivalents, as well as the favorable impact of higher interest rates.

Impairment and other related charges, net

During 2023, as a result of its annual impairment testing performed in the fourth quarter, the Company recorded Impairment and other related charges, net of \$158 million due to the goodwill impairment recognized for the traffic solutions reporting unit and \$2 million to reduce the carrying value of certain indefinite-lived trademarks.

During 2022, the Company recorded Impairment and other related charges, net of \$227 million associated with the wind down of the Company's operations in Russia. The Company also recorded impairment charges of \$14 million related to the sale of certain small, non-strategic businesses and \$4 million to reduce the carrying value of certain indefinite-lived trademarks based on the results of the annual impairment test.

Refer to Note 6, "Goodwill and Other Identifiable Intangible Assets and Note 7 "Impairment and Other Related Charges, Net" in Item 8 of this Form 10-K for additional information.

Pension settlement charge

In March 2023, the Company purchased group annuity contracts that transferred to third-party insurance companies pension benefit obligations for certain of the Company's retirees in the U.S. who were receiving their monthly retirement benefit payments from the U.S. pension plan. This transaction resulted in a pension settlement charge of \$190 million. Refer to Note 14, "Employee Benefit Plans" in Item 8 of this Form 10-K for additional information.

Other charges/(income), net

Other charges/(income), net was higher in 2023 compared to the prior year primarily due to an increase in the non-service cost components of pension and other postretirement benefit expense, an increase in environmental remediation costs and foreign currency losses recognized in Argentina related to a central bank adjustment to official foreign currency rates, partially offset by a decrease in net business restructuring expense. Refer to Note 18, "Other Charges/(Income), Net" in Item 8 of this Form 10-K for additional information.

Effective tax rate and earnings per diluted share, continuing operations

	<i>% Change</i>		
<i>(\$ in millions, except percentages)</i>	2023	2022	2023 vs. 2022
Income tax expense	\$439	\$325	35.1%
Effective tax rate	25.1%	23.5%	1.6%
Adjusted effective tax rate, continuing operations*	22.0%	22.0%	—%
Earnings per diluted share, continuing operations	\$5.35	\$4.33	23.6%
Adjusted earnings per diluted share, continuing operations*	\$7.67	\$6.05	26.8%

*See the Regulation G reconciliations - results of operations

The effective tax rate for the year-ended December 31, 2023 was 25.1%, an increase of 1.6% from the prior year due in part to the goodwill impairment charge, for which there was no tax benefit. The adjusted effective tax rate was 22.0% for the years ended December 31, 2023 and 2022.

Earnings per diluted share from continuing operations for the year ended December 31, 2023 increased year over year primarily due to increased selling prices, moderating raw material cost inflation and favorable foreign currency translation impact, partially offset by lower sales volumes. Refer to the Regulation G Reconciliations - Results from Operations for additional information.

Review and Outlook

PPG achieved annual records for net sales, adjusted earnings per diluted share and operating cash flow in 2023. Net sales were \$18.2 billion, an increase of 3% over the prior year. Results were supported by the breadth and diversity of the business portfolio, as the company benefited from higher prices in all businesses and favorable foreign currency translation, which offset lower sales volumes. Net sales, excluding the impact of currency, acquisitions, divestitures and the wind down of Russia operations ("organic sales") increased 3% during the year driven by continued strong growth in our aerospace coatings and automotive OEM coatings businesses. On a regional basis, sales volumes were modestly higher in the Asia Pacific and Latin America regions, and the EMEA, Asia Pacific, and Latin America regions all delivered record segment earnings for the year. Earnings per diluted share from continuing operations was \$5.35, compared to \$4.33 in the prior year. Adjusted earnings per diluted share was \$7.67, up 27% compared to \$6.05 in 2022. Combined, segment income increased by more than 30%. Aggregate segment margins were 310 basis points higher than the prior year, driven by strong selling price realization and moderating raw material costs, partially offset by higher selling, general and administrative costs and lower sales volumes.

During 2023, there was continued recovery in the end-use markets that were impacted by mobility restrictions in 2020 and 2021, such as automotive OEM and aerospace coatings; however, demand in these markets remains below 2019 levels. Global automotive OEM manufacturers' production increased by about 9% versus 2022 due to strong underlying demand in all regions. Demand for PPG products was mixed by end-use market and geographic region. In the U.S. and Canada, demand was strong for aerospace coatings and protective and marine coatings but declined for most other businesses. In Latin America, demand was solid throughout the year with steady demand for architectural products and growth in automotive OEM products, protective and marine coatings and automotive refinish coatings. The PPG Comex business made strong contributions, expanding the number of concessionaire locations during 2023 to nearly 5,200 locations. Demand was soft in Europe with the largest impact on the architectural coatings business. In Asia, demand was mixed, as activity in China was impacted by pandemic-related restrictions and associated disruptions in the first quarter of 2023,

while demand conditions in the rest of Asia were more stable. Raw material costs declined for most of the year, but still finished the fourth quarter above fourth quarter 2019 levels. Raw material costs continue to moderate and are anticipated to ease further in the beginning of 2024. Some other key costs are expected to increase in 2024, including logistics, employee wage and benefit costs and energy costs.

We expect softening global economic activity in 2024 that will likely be uneven by region and end use. In 2024, we expect an increase in volumes driven by demand growth in China, India and Mexico, industry growth in aerospace, and economic stabilization in Europe. We expect global demand for architectural coatings to remain subdued and global industrial production to persist at lower absolute levels. Demand for protective coatings is expected to be strong and growth in the traffic solutions business should be aided in 2024 as infrastructure spending gains momentum. In general, most end-use markets do not have significant excess inventories, and any demand improvement should lead to a faster ramp-up of sales volumes.

Significant other factors

During the year, PPG successfully executed on various strategic initiatives to strengthen the company, including key actions to position PPG for higher organic growth. The Company also continued its ongoing portfolio review leading to the divestitures of both our European and Australian traffic solutions businesses and the recently announced strategic alternatives review of the silicas products business.

We approved business restructuring actions to reduce costs and improve the profitability of our overall business portfolio during 2023, as well as made significant progress on the global restructuring programs that were announced in 2021 and 2022. Total restructuring savings, including the impact of acquisition synergies, was approximately \$60 million in 2023. Total restructuring savings are expected to be approximately \$35 million in 2024. We expect cash outlays related to restructuring actions of \$80 million to \$90 million in 2024. We will continue to monitor and aggressively manage the Company's cost structure to ensure alignment with the overall demand environment.

Raw materials are our most significant input cost. PPG experiences fluctuating energy and raw material costs driven by various factors, including changes in supplier feedstock costs and inventories, global industry activity levels, foreign currency exchange rates, and global supply and demand factors.

In 2023, supply chain and pandemic-related disruptions experienced from 2020 through 2022 have eased, resulting in ample supply of commodity-related raw materials in all regions. For 2023 versus 2022, raw material costs moderated, resulting in a favorable impact to our operating costs. We expect manufacturing efficiencies to improve as the year progresses in 2024. While raw material costs declined during the current year, the Company continues to incur wage inflation, and anticipates further wage inflation impacts in 2024.

We achieved selling price improvement across all businesses in 2023, reflecting the Company's efforts to offset various inflationary pressures. The Company will carefully monitor all costs during 2024 and assess the need for additional selling price increases.

In 2023, foreign currency rates were volatile, with the U.S. dollar strengthening against certain currencies and weakening against other currencies in the countries within the regions where PPG operates, resulting in a net favorable impact to net income of \$25 million. Notably and separately, in December 2023, the central bank of Argentina adjusted the official foreign currency exchange rate for the Argentine peso, significantly devaluing the currency relative to the United States dollar, resulting in recognition of foreign currency losses of \$20 million. We expect that foreign currency rates will continue to be volatile. However, the Company generally purchases raw materials, incurs manufacturing costs and sells finished goods in the same currency, so we typically incur only modest foreign currency transaction-related impacts.

The 2024 effective tax rate from continuing operations is expected to be in the range of 23% to 24%, varying by quarter. This range is the Company's best estimate and represents an increase compared to the 2023 adjusted effective tax rate driven by higher rates in certain countries, including the impact of recent global minimum tax standards, and the geographic mix of earnings.

Over the past five years, the Company used over \$800 million of cash to repurchase approximately six million shares of PPG stock, including using \$86 million to repurchase shares of PPG stock during 2023. The Company ended the year with approximately \$1 billion remaining under its current share repurchase authorization. During 2023, the Company deployed \$109 million for acquisitions, \$549 million for capital expenditures and \$598 million for dividends. In 2023, PPG marked the 52nd annual per share dividend increase and the 124th successive year of annual dividend payments.

PPG ended 2023 with approximately \$1.6 billion in cash and short-term investments. The Company expects strong cash generation in 2024.

Regulation G Reconciliations - Results from Operations

PPG believes investors' understanding of the Company's performance is enhanced by the disclosure of net income from continuing operations, earnings per diluted share from continuing operations, PPG's effective tax rate and segment income adjusted for certain items. PPG's management considers this information useful in providing insight into the Company's ongoing performance because it excludes the impact of items that cannot reasonably be expected to recur on a quarterly basis or that are not attributable to our primary operations. Net income from continuing operations, earnings per diluted share from continuing operations, the effective tax rate and segment income adjusted for these items are not recognized financial measures determined in accordance with U.S. generally accepted accounting principles ("U.S. GAAP") and should not be considered a substitute for net income from continuing operations, earnings per diluted share from continuing operations, the effective tax rate, segment income or other financial measures as computed in accordance with U.S. GAAP. In addition, adjusted net income, adjusted earnings per diluted share and the adjusted effective tax rate may not be comparable to similarly titled measures as reported by other companies.

Income before income taxes from continuing operations is reconciled to adjusted income before income taxes from continuing operations, the effective tax rate from continuing operations is reconciled to the adjusted effective tax rate from continuing operations and net income from continuing operations (attributable to PPG) and earnings per share – assuming dilution (attributable to PPG) are reconciled to adjusted net income from continuing operations (attributable to PPG) and adjusted earnings per share – assuming dilution below.

(\$ in millions, except percentages and per share amounts)	Income Before Income Taxes	Income Tax Expense	Effective Tax Rate	Net Income (attributable to PPG)	Earnings per Diluted Share ⁽¹⁾
Year-ended December 31, 2023					
As reported, continuing operations	\$1,748	\$439	25.1%	\$1,270	\$5.35
Includes:					
Acquisition-related amortization expense	161	40	24.8%	121	0.51
Business restructuring-related costs, net ⁽²⁾	43	9	20.9%	34	0.14
Impairment and other related charges, net ⁽³⁾	160	—	—%	160	0.67
Portfolio optimization ⁽⁴⁾	53	(7)	(13.2%)	58	0.24
Environmental remediation charges, net ⁽⁵⁾	30	7	23.3%	23	0.10
Argentina currency devaluation losses ⁽⁶⁾	20	(4)	(20.0%)	24	0.10
Insurance recoveries ⁽⁷⁾	(16)	(4)	25.0%	(12)	(0.05)
Pension settlement charge ⁽⁸⁾	190	46	24.2%	144	0.61
Adjusted, continuing operations, excluding certain items	\$2,389	\$526	22.0%	\$1,822	\$7.67

(\$ in millions, except percentages and per share amounts)	Income Before Income Taxes	Income Tax Expense	Effective Tax Rate	Net Income (attributable to PPG)	Earnings per Diluted Share ⁽¹⁾
Year-ended December 31, 2022					
As reported, continuing operations	\$1,381	\$325	23.5%	\$1,028	\$4.33
Includes:					
Acquisition-related amortization expense	166	40	24.1%	126	0.53
Business restructuring-related costs, net ⁽²⁾	75	19	25.3%	56	0.24
Impairment and other related charges, net ⁽³⁾	245	31	12.7%	214	0.90
Portfolio optimization ⁽⁴⁾	10	(2)	(20.0%)	12	0.05
Adjusted, continuing operations, excluding certain items	\$1,877	\$413	22.0%	\$1,436	\$6.05

- (1) Earnings per diluted share is calculated based on unrounded numbers. Figures in the table may not recalculate due to rounding.
- (2) Business restructuring-related costs, net include business restructuring charges, offset by releases related to previously approved programs, which are included in Other charges/(income), net on the consolidated statement of income, accelerated depreciation of certain assets, which is included in Depreciation on the consolidated statement of income, and other restructuring-related costs, which are included in Cost of sales, exclusive of depreciation and amortization and Selling, general and administrative on the consolidated statement of income.
- (3) In the fourth quarter 2023, the Company recorded Impairment and other related charges, net due to goodwill impairment recognized for the traffic solutions reporting unit as a result of its annual goodwill impairment test. The fair value of the traffic solutions reporting unit decreased primarily due to increases in the cost of capital (discount rate assumption) and declines in the reporting unit's long-term forecast driven by challenges at its operations in Argentina due to the highly inflationary environment and changes to the reporting unit's global footprint, including the fourth quarter 2023 divestiture of its European and Australian businesses. In 2022, the Company recorded Impairment and other related charges, net due to the wind down of the company's operation in Russia.
- (4) Portfolio optimization includes losses on the sale of non-core assets, including the losses recognized on the sales of the Company's European and Australian traffic solutions businesses in the fourth quarter 2023, which are included in Other charges/(income), net in the consolidated statement of income, accelerated amortization expense recognized related to the exit of a non-core business, which is included in Amortization in the consolidated statement of income, and the impact for the step up to fair value of inventory acquired in certain acquisitions, which is included in Cost of sales, exclusive of depreciation and amortization in the consolidated statement of income. Portfolio optimization also includes advisory, legal, accounting, valuation, other professional or consulting fees, and certain internal costs directly incurred to effect acquisitions, as well as similar fees

and other costs to effect divestitures and other portfolio optimization exit actions. These costs are included in Selling, general and administrative expense in the consolidated statement of income.

- (5) Environmental remediation charges represent environmental remediation costs at certain legacy PPG manufacturing sites. These charges are included in Other charges/(income), net in the consolidated statement of income.
- (6) In December 2023, the central bank of Argentina adjusted the official foreign currency exchange rate for the Argentine peso, significantly devaluing the currency relative to the United States dollar. Argentina currency devaluation losses represent foreign currency translation losses recognized during December 2023 related to the devaluation of the Argentine peso, which is included in Other charges/(income), net in the consolidated statement of income.
- (7) In the first quarter 2023, the Company received reimbursement under its insurance policies for damages incurred at a southern U.S. factory from a winter storm in 2020. In the fourth quarter 2023, the Company received reimbursement for a previously approved insurance claim under a policy covering legacy asbestos-related matters. These insurance recoveries are included in Other charges/(income), net in the consolidated statement of income.
- (8) In the first quarter 2023, PPG purchased group annuity contracts that transferred pension benefit obligations for certain of the Company's retirees in the U.S. to third-party insurance companies, resulting in a non-cash pension settlement charge.

Performance of Reportable Business Segments

Performance Coatings

			\$ Change	% Change
(\$ in millions, except percentages)	2023	2022	2023 vs. 2022	2023 vs. 2022
Net sales	\$11,164	\$10,694	\$470	4.4%
Segment income	\$1,709	\$1,399	\$310	22.2%
Amortization expense	\$114	\$123	(\$9)	(7.3)%
Segment income, excluding amortization expense	\$1,823	\$1,522	\$301	19.8%

Performance Coatings net sales increased due to the following:

- Higher selling prices (+5%)
- Foreign currency translation (+1%)

Partially offset by:

- Lower sales volumes (-2%)

In 2023, all businesses within the Performance Coatings reportable business segment achieved higher selling prices, which helped to offset lower sales volumes due to soft demand conditions in Europe.

Architectural coatings – EMEA organic sales were flat year over year, with higher selling prices offset by lower sales volumes. Regional demand remains uneven by country, and positive sales trends occurred in some countries, including the United Kingdom, Poland and the Netherlands.

Architectural coatings – Americas and Asia Pacific organic sales increased a low single-digit percentage during the year primarily due to selling price increases. Sales in the U.S. and Canada were unfavorably impacted by soft do-it-yourself (“DIY”) demand. In Mexico, architectural coatings organic sales increased compared to the prior year, as concessionaire network demand continued to be strong throughout 2023 and further selling price increases were implemented.

Automotive refinish coatings organic sales increased a low single-digit percentage year over year. Price gains in all regions and sales volume growth in the Latin America and Asia Pacific regions were partially offset by lower sales volumes in all other regions. In the U.S., body shop activity remains solid, with sales volumes impacted mostly due to shifting order patterns from certain U.S. distribution customers. In Europe, sales volumes were below 2022 levels but began to turn positive in the second half of the year. In China, demand for PPG refinish products continues to recover.

Aerospace coatings organic sales were higher by 20% driven by increases in both price and volume. This strong organic sales growth was achieved despite global air travel remaining below pre-pandemic levels. Demand remained strong in all major product categories throughout the year.

Protective and marine coatings organic sales increased by a mid-single-digit percentage driven by solid selling price realization and higher sales volumes.

Traffic solutions organic sales decreased by a mid-single-digit percentage year over year, with sales volume declines in all regions. In the U.S., the Company continues to prioritize higher margin business.

Segment income increased \$310 million year over year primarily due to higher selling prices and moderating raw material costs, partially offset by wage and other cost inflation and lower sales volumes.

Looking Ahead

In the first quarter 2024, demand for aerospace coatings, protective and marine coatings and products sold in Mexico is expected to remain robust. Demand conditions in the Europe region, the Asia Pacific region and for DIY architectural coatings in the U.S are anticipated to remain at lower levels. Aggregate organic sales for the Performance Coatings segment are anticipated to increase by a low single-digit percentage compared to the first quarter 2023. The Company will continue to focus on executing various existing cost-savings initiatives.

Industrial Coatings

			\$ Change	% Change
(\$ in millions, except percentages)	2023	2022	2023 vs. 2022	2023 vs. 2022
Net sales	\$7,082	\$6,958	\$124	1.8%
Segment income	\$966	\$643	\$323	50.2%
Amortization expense	\$46	\$43	\$3	7.0%
Segment income, excluding amortization expense	\$1,012	\$686	\$326	47.5%

Industrial Coatings segment net sales increased due to the following:

- Higher selling prices (+4%)

Partially offset by:

- Lower sales volumes (-2%)

In 2023, all businesses within the Industrial Coatings reportable business segment achieved higher selling prices, which helped to offset a decrease in sales volumes driven by lower global industrial production.

Automotive OEM coatings organic sales increased by a high single-digit percentage year over year driven by higher selling prices and strong sales volume growth in most regions. Sales volume growth was led by the EMEA and Asia Pacific regions, where retail sales and industry build rates are beginning to return to pre-pandemic levels.

For the industrial coatings business, organic sales decreased by a mid-single-digit percentage year over year as higher selling prices were more than offset by lower sales volumes in all regions due to softening global industrial demand.

Packaging coatings organic sales decreased by a mid-single-digit percentage year over year due to lower sales volume in all regions driven by broad demand weakness. These sales volume decreases were partially offset by higher selling prices in most regions.

Specialty coatings and materials organic sales decreased by a mid-single-digit percentage primarily due to lower sales volumes, partially offset by higher selling prices.

Segment income increased \$323 million year over year primarily due to higher selling prices and moderating raw material costs, partially offset by wage and other cost of sales inflation and lower sales volumes.

Looking Ahead

In the first quarter 2024, global industrial production is expected to remain at lower levels. Aggregate organic sales are anticipated to decrease by a low single-digit percentage compared to the first quarter 2023. Automotive industry build rates are expected to be flat to slightly lower in most regions, except in the Asia Pacific region where solid growth is anticipated. Additionally, sales volumes in the packaging coatings business are expected to increase compared to the prior-year first quarter. In the fourth quarter, the pricing gains negotiated in 2022 reached their anniversary, and price decreases are anticipated in 2024 due to index pricing with certain customers within the segment and reflecting the elimination of certain energy-based surcharges in Europe from early 2023. The Company will continue to focus on executing against various existing cost-savings initiatives.

Commitments and Contingent Liabilities, including Environmental Matters

PPG is involved in a number of lawsuits and claims, both actual and potential, including some that it has asserted against others, in which substantial monetary damages are sought. Refer to Item 3. "Legal Proceedings" and Note 15, "Commitments and Contingent Liabilities" in Item 8 of this Form 10-K for a description of certain of these lawsuits.

As discussed in Item 3 and Note 15, although the result of any future litigation of such lawsuits and claims is inherently unpredictable, management believes that, in the aggregate, the outcome of all lawsuits and claims involving PPG, including asbestos-related claims, will not have a material effect on PPG's consolidated financial position or liquidity; however, any such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized.

As also discussed in Note 15, PPG has significant reserves for environmental contingencies. Refer to the Environmental Matters section of Note 15 for details of these reserves. It is PPG's policy to accrue expenses for contingencies when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. Reserves for environmental contingencies are exclusive of claims against third parties and are generally not discounted. In management's opinion, the Company operates in an environmentally sound manner and the outcome of the Company's environmental contingencies will not have a material effect on PPG's financial position or liquidity; however, any such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized. Management anticipates that the resolution of the Company's environmental contingencies will occur over an extended period of time.

Accounting Standards Adopted in 2023

Note 1, "Summary of Significant Accounting Policies" in Item 8 of this Form 10-K describes the Company's recently adopted accounting pronouncements.

Accounting Standards to be Adopted in Future Years

Note 1, "Summary of Significant Accounting Policies" in Item 8 of this Form 10-K describes accounting pronouncements that have been promulgated prior to December 31, 2023 but are not effective until a future date.

Liquidity and Capital Resources

During the past two years, PPG had sufficient financial resources to meet its operating requirements, to fund our capital spending, including acquisitions, share repurchases and pension plans, and to pay increasing dividends to shareholders.

Cash and cash equivalents and short-term investments

(\$ in millions)	2023	2022
Cash and cash equivalents	\$1,514	\$1,099
Short-term investments	75	55
Total	\$1,589	\$1,154

Cash from operating activities - continuing operations

(\$ in millions, except percentages)	2023	2022	% Change 2023 vs. 2022
Cash from operating activities	\$2,411	\$963	150.4%

2023 vs. 2022

The \$1,448 million increase in Cash from operating activities - continuing operations was primarily due to higher net income driven by higher selling prices and moderating raw material costs and favorable changes in working capital compared to the prior year.

Operating working capital

Operating working capital is a subset of total working capital and represents (1) receivables from customers, net of allowance for doubtful accounts, (2) inventories, and (3) trade liabilities. Refer to Note 3, "Working Capital Detail" in Item 8 of this Form 10-K for further information related to the components of the Company's operating working capital. We believe operating working capital represents the key components of working capital under the operating control of our businesses.

A key metric we use to measure our working capital management is operating working capital as a percentage of sales (fourth quarter sales annualized).

(\$ in millions, except percentages)	2023	2022
Trade receivables, net	\$2,881	\$2,824
Inventories, FIFO	2,376	2,544
Trade creditors' liabilities	2,612	2,538
Operating working capital	\$2,645	\$2,830
Operating working capital as a % of fourth quarter sales, annualized	15.2%	16.9%
Trade receivables, net as a % of fourth quarter sales, annualized	16.6%	16.9%
Days sales outstanding	55	56
Inventories, FIFO as a % of fourth quarter sales, annualized	13.7%	15.2%
Inventory turnover	4.4	4.5

Environmental expenditures

(\$ in millions)	2023	2022
Cash outlays related to environmental remediation activities	\$36	\$78

We expect cash outlays for environmental remediation activities in 2024 to be between \$40 million and \$60 million.

Cash used for investing activities

(\$ in millions, except percentages)	2023	2022	% Change 2023 vs. 2022
Cash used for investing activities	\$556	\$461	20.6%

2023 vs. 2022

The \$95 million increase in cash used for investing activities was primarily due to higher capital expenditures and lower proceeds from asset sales.

Capital expenditures, including business acquisitions

(\$ in millions, except percentages)	2023	2022	% Change 2023 vs. 2022
Capital expenditures ⁽¹⁾	\$549	\$518	6.0%
Business acquisitions, net of cash balances acquired	\$109	\$114	(4.4)%
Total capital expenditures, including acquisitions	\$658	\$632	4.1%
Capital expenditures, excluding acquisitions, as a % of sales	3.0%	2.9%	3.4%

(1) Includes modernization and productivity improvements, expansion of existing businesses and environmental control projects.

During 2024, capital expenditures, which are expected to be approximately \$600 million, will support future organic growth opportunities. The Company will continue to deploy cash focused on shareholder value creation, with a preference for business acquisitions, coupled with prudent debt reduction to enhance financial flexibility.

Cash used for financing activities

(\$ in millions, except percentages)	2023	2022	% Change 2023 vs. 2022
Cash used for financing activities	(\$1,550)	(\$409)	279.0%

2023 vs. 2022

The \$1,141 million increase in cash used for financing activities was primarily due to repayments of long-term debt and lower proceeds from the issuance of debt, partially offset by the absence of net payments on commercial paper.

Share repurchase activity

(\$ in millions, except number of shares)	2023	2022
Number of shares repurchased (millions)	0.6	1.5
Cash paid for shares repurchased	\$86	\$190

The Company has approximately \$1.0 billion remaining under the current authorization from the Board of Directors, which was approved in December 2017. The current authorized repurchase program has no expiration date.

Dividends paid to shareholders

(\$ in millions)	2023	2022
Dividends paid to shareholders	\$598	\$570

PPG has paid uninterrupted annual dividends since 1899, and 2023 marked the 52nd successive year of increased annual per-share dividend payments to shareholders. The Company raised its per-share quarterly dividend by approximately 5% to \$0.65 per share in July 2023.

Debt issued and repaid

<i>Debt Issued (net of premium/discount and issuance costs)</i>	<i>Year</i>	<i>\$ in millions</i>
Term Loan Credit Agreement, due 2026	2023	\$550
1.875% notes (€300) due 2025	2022	\$319
2.750% notes (€700) due 2029	2022	\$742
1.95% note (€50) due 2037	2022	\$55

<i>Debt Repaid</i>	<i>Year</i>	<i>\$ in millions</i>
3.2% notes (\$300)	2023	\$300
Term Loan Credit Agreement, due 2024	2023	\$1,100
Term Loan Credit Agreement, due 2024	2022	\$300
Acquired debt	2022	\$2

The Company's commercial paper borrowings are classified as long-term debt based on PPG's intent and ability to refinance these borrowings on a long-term basis. Net payments on commercial paper were zero and \$440 million for the years ended December 31, 2023 and December 31, 2022, respectively.

Credit agreements and lines of credit

In April 2023, PPG entered into a €500 million term loan credit agreement (the "Term Loan"). The Term Loan provides the Company with the ability to increase the size of the loan by an amount not to exceed €250 million. The Term Loan contains covenants that are consistent with those in the Credit Agreement discussed below and that are usual and customary restrictive covenants for facilities of its type, which include, with specified exceptions, limitations on the Company's ability to create liens or other encumbrances, to enter into sale and leaseback transactions and to enter into consolidations, mergers or transfers of all or substantially all of its assets. The Term Loan terminates and all amounts outstanding are payable in April 2026. In April 2023, PPG borrowed €500 million under the Term Loan. In December 2023, PPG obtained lender commitments sufficient to increase the size of the Term Loan by €250 million. In January 2024, PPG borrowed the additional €250 million.

In February 2021, PPG entered into a \$2.0 billion term loan credit agreement (the "Term Loan Credit Agreement") to finance the Company's acquisition of Tikkurila, and to pay fees, costs and expenses related thereto. The Term Loan Credit Agreement provided the Company with the ability to borrow up to an aggregate principal amount of \$2.0 billion on an unsecured basis. In addition to the amounts borrowed to finance the acquisition of Tikkurila, the Term Loan Credit Agreement allowed the Company to make up to eleven additional borrowings prior to December 31, 2021, to be used for working capital and general corporate purposes. The Term Loan Credit Agreement contains covenants that are consistent with those in the Credit Agreement discussed below and that are usual and customary restrictive covenants for facilities of its type, which include, with specified exceptions, limitations on the Company's ability to create liens or other encumbrances, to enter into sale and leaseback transactions and to enter into consolidations, mergers or transfers of all or substantially all of its assets. The Term Loan Credit Agreement matures and all outstanding borrowings are due and payable on the third anniversary of the date of the initial borrowing under the Agreement. In June 2021, PPG borrowed \$700 million under the Term Loan Credit Agreement to finance the Company's acquisition of Tikkurila, and to pay fees, costs and expenses related thereto. In December 2021, PPG borrowed an additional \$700 million under the Term Loan Credit Agreement. In 2022 and 2023, PPG repaid \$300 million and \$1.1 billion, respectively, of the Term Loan Credit Agreement using cash on hand. In March 2023, PPG amended the Term Loan Credit Agreement to replace the LIBOR-based reference interest rate option with a reference interest rate option based upon Term Secured Overnight Financing Rate ("SOFR"). The other terms of the Term Loan Credit Agreement remain unchanged. The Term Loan Credit Agreement was fully repaid as of December 31, 2023. Borrowings of \$1.1 billion were outstanding under the Term Loan Credit Agreement as of December 31, 2022.

In March 2023, PPG amended its five-year credit agreement (the "Credit Agreement") dated as of August 30, 2019. The amendments to the Credit Agreement replace the LIBOR-based reference interest rate option with a reference interest rate option based upon Term SOFR. The other terms of the Credit Agreement remained unchanged. In July 2023, PPG amended and restated the Credit Agreement, extending the term through July 27, 2028. The amended and restated Credit Agreement provides for a \$2.3 billion unsecured revolving credit facility. The Company has the ability to increase the size of the Credit Agreement by up to an additional \$750 million, subject to the receipt of lender commitments and other conditions precedent. The Company has the right, subject to certain conditions set forth in the Credit Agreement, to designate certain subsidiaries of the Company as borrowers under the Credit Agreement. In connection with any such designation, the Company is required to guarantee the obligations of any such subsidiaries under the Credit Agreement. There were no amounts outstanding under the Credit Agreement as of December 31, 2023 and December 31, 2022.

The Term Loan and the Credit Agreement require the Company to maintain a ratio of Total Indebtedness to Total Capitalization, as defined in the Term Loan and the Credit Agreement, of 60% or less; provided, that for any fiscal quarter in which the Company has made an acquisition for consideration in excess of \$1 billion and for the next five fiscal quarters thereafter, the ratio of Total Indebtedness to Total Capitalization may not exceed 65% at any time. As of December 31, 2023, Total Indebtedness to Total Capitalization as defined under the Credit Agreement and the Term Loan was 42%.

In addition to the amounts available under lines of credit, the Company maintains access to the capital markets and may issue debt or equity securities from time to time, which may provide an additional source of liquidity.

Refer to Note 10, "Borrowings and Lines of Credit" in Item 8 of this Form 10-K for information regarding notes entered into and repaid as well as details regarding the use and availability of committed and uncommitted lines of credit, letters of credit and debt covenants.

Cash requirements

We continue to believe that our cash on hand and short-term investments, cash from operations and the Company's access to capital markets will continue to be sufficient to fund our operating activities, capital spending, acquisitions, dividend payments, debt service, share repurchases, contributions to pension plans, and PPG's significant cash requirements. The Company's significant cash requirements include the following contractual obligations and commitments.

(\$ in millions)	Total	Obligations Due In:			
		2024	2025-2026	2027-2028	Thereafter
Long-term debt	\$6,050	\$302	\$2,239	\$1,446	\$2,063
Interest payments ⁽¹⁾	\$966	\$134	\$239	\$192	\$401
Operating leases ⁽²⁾	\$896	\$216	\$313	\$183	\$184
Unconditional purchase commitments ⁽³⁾	\$343	\$136	\$157	\$36	\$14

(1) Interest on all outstanding debt.

(2) Includes interest payments.

(3) The unconditional purchase commitments are principally take-or-pay obligations related to the purchase of certain materials, utilities and services consistent with customary industry practice.

The Company's off-balance sheet arrangements include unconditional purchase commitments disclosed in the "Liquidity and Capital Resources" section in the cash requirements table as well as letters of credit as discussed in Note 10, "Borrowings and Lines of Credit" in Item 8 of this Form 10-K.

Other liquidity matters

At December 31, 2023, the total amount of unrecognized tax benefits for uncertain tax positions, including an accrual of related interest and penalties along with positions only impacting the timing of tax benefits, was \$135 million. The timing of payments will depend on the progress of examinations by tax authorities. PPG does not expect a significant tax payment related to these obligations within the next year. The Company is unable to make a reasonably reliable estimate as to if, or when, any significant cash settlements with tax authorities may occur.

Critical Accounting Estimates

Management has evaluated the accounting policies used in the preparation of the financial statements and related notes presented in Item 8 of this Form 10-K and believes those policies to be reasonable and appropriate. We believe that the most critical accounting estimates made in the preparation of our financial statements are those related to accounting for contingencies, under which we accrue a loss when it is probable that a liability has been incurred and the amount can be reasonably estimated, and to accounting for pensions, other postretirement benefits, business combinations, goodwill and other identifiable intangible assets with indefinite lives because of the importance of management judgment in making the estimates necessary to apply these policies.

Contingencies

Contingencies, by their nature, relate to uncertainties that require management to exercise judgment both in assessing the likelihood that a liability has been incurred as well as in estimating the amount of potential loss. The most important contingencies impacting our financial statements are those related to environmental remediation, to pending, impending or overtly threatened litigation against the Company and to the resolution of matters related to open tax years. For more information on these matters, see Note 15, "Commitments and Contingent Liabilities" and Note 13, "Income Taxes" in Item 8 of this Form 10-K.

Defined Benefit Pension and Other Postretirement Benefit Plans

Accounting for pensions and other postretirement benefits involves estimating the cost of benefits to be provided well into the future and attributing that cost over the time period each employee works. To accomplish this, we make extensive use of assumptions about inflation, investment returns, mortality, turnover, medical costs and discount rates. The Company has established a process by which management reviews and selects these assumptions annually. Refer to Note 14, “Employee Benefit Plans” in Item 8 of this Form 10-K for information on these plans and the assumptions used.

Business Combinations

The Company uses the acquisition method of accounting to allocate costs of acquired businesses to the assets acquired and liabilities assumed based on their estimated fair values at the dates of acquisition. The excess costs of acquired businesses over the fair values of the assets acquired and liabilities assumed is recognized as goodwill. The valuations of the acquired assets and liabilities impacts the determination of future operating results. In addition to using management estimates and negotiated amounts, the Company uses a variety of information sources to determine the estimated fair values of acquired assets and liabilities including: third-party appraisals for the estimated value and lives of identifiable intangible assets and property, plant and equipment; third-party actuaries for the estimated obligations of defined benefit pension plans and similar benefit obligations; and legal counsel or other experts to assess the obligations associated with legal, environmental and other contingent liabilities.

The business and technical judgment of management is used in determining which acquired intangible assets have indefinite lives and in determining the useful lives of acquired finite-lived intangible assets in accordance with the accounting guidance for goodwill and other intangible assets.

Goodwill and Intangible Assets

The Company tests indefinite-lived intangible assets and goodwill for impairment by either performing a qualitative evaluation or a quantitative test at least annually, or more frequently if an indication of impairment arises. The qualitative evaluation is an assessment of factors to determine whether it is more likely than not that the fair value of a reporting unit or asset is less than its carrying amount. In the quantitative test, fair values are estimated using a discounted cash flow model. Key assumptions and estimates used in the discounted cash flow model include projected future revenues, discount rates, operating cash flows, capital expenditures and tax rates. For more information on these matters, see Note 1, “Summary of Significant Accounting Policies” in Item 8 of this Form 10-K.

We believe that the amounts recorded in the financial statements in Item 8 of this Form 10-K related to these contingencies, pensions, other postretirement benefits, business combinations, goodwill and other identifiable intangible assets with indefinite lives are based on the best estimates and judgments of the appropriate PPG management, although actual outcomes could differ from our estimates.

Currency

Comparing spot exchange rates at December 31, 2023 and at December 31, 2022, the U.S. dollar weakened against the currencies of many countries within the regions PPG operates, most notably the Mexican peso. As a result, consolidated net assets at December 31, 2023 increased by \$508 million from December 31, 2022.

Comparing average exchange rates during 2023 to those of 2022, the U.S. dollar weakened against the currencies of certain countries where PPG operates, including the Mexican peso and the euro, partially offset by strengthening against the Chinese yuan and Argentine peso. This had a favorable impact of approximately \$25 million on full year 2023 Income before income taxes from the translation of this foreign income into U.S. dollars.

Forward-Looking Statements

The Private Securities Litigation Reform Act of 1995 provides a safe harbor for forward-looking statements made by or on behalf of the Company. Management’s Discussion and Analysis and other sections of this Annual Report contain forward-looking statements that reflect the Company’s current views with respect to future events and financial performance. You can identify forward-looking statements by the fact that they do not relate strictly to current or historic facts. Forward-looking statements are identified by the use of the words “aim,” “believe,” “expect,” “anticipate,” “intend,” “estimate,” “project,” “outlook,” “forecast” and other expressions that indicate future events and trends. Any forward-looking statement speaks only as of the date on which such statement is made, and the Company undertakes no obligation to update any forward-looking statement, whether as a result of new information, future events or otherwise. You are advised, however, to consult any further disclosures we make on related subjects in our reports to the SEC. Also, note the following cautionary statements.

Many factors could cause actual results to differ materially from the Company’s forward-looking statements. Such factors include statements related to the effects on our business of COVID-19, global economic conditions, geopolitical issues, increasing price and product competition by our competitors, fluctuations in cost and availability of raw materials, energy, labor and logistics, the ability to achieve selling price increases, the ability to recover margins, customer inventory levels,

PPG inventory levels, our ability to maintain favorable supplier relationships and arrangements, the timing of and the realization of anticipated cost savings from restructuring initiatives, the ability to identify additional cost savings opportunities, the timing and expected benefits of our acquisitions, difficulties in integrating acquired businesses and achieving expected synergies therefrom, the amount of future share repurchases, economic and political conditions in the markets we serve, the ability to penetrate existing, developing and emerging foreign and domestic markets, foreign exchange rates and fluctuations in such rates, fluctuations in tax rates, the impact of future legislation, the impact of environmental regulations, unexpected business disruptions, the unpredictability of existing and possible future litigation, including asbestos litigation, and government investigations. However, it is not possible to predict or identify all such factors.

Consequently, while the list of factors presented here and in Item 1A is considered representative, no such list should be considered to be a complete statement of all potential risks and uncertainties. Unlisted factors may present significant additional obstacles to the realization of forward-looking statements.

Consequences of material differences in the results compared with those anticipated in the forward-looking statements could include, among other things, lower sales or income, business disruption, operational problems, financial loss, legal liability to third parties, other factors set forth in Item 1A of this Form 10-K and similar risks, any of which could have a material adverse effect on the Company's consolidated financial condition, results of operations or liquidity. PPG undertakes no obligation to update any forward-looking statement, except as otherwise required by applicable law.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

PPG is exposed to market risks related to changes in foreign currency exchange rates and interest rates. The Company may enter into derivative financial instrument transactions in order to manage or reduce these market risks. A detailed description of these exposures and the Company's risk management policies are provided in Note 11, "Financial Instruments, Hedging Activities and Fair Value Measurements" in Item 8 of this Form 10-K.

The following disclosures summarize PPG's exposure to market risks and information regarding the use of and fair value of derivatives employed to manage its exposure to such risks. Quantitative sensitivity analyses have been provided to reflect how reasonably possible, unfavorable changes in market rates could impact PPG's consolidated results of operations, cash flows and financial position.

Foreign Currency Risk

We conduct operations in many countries around the world. Our results of operations are subject to both currency transaction and currency translation risk. Certain foreign currency forward contracts outstanding during 2023 and 2022 served as a hedge of a portion of PPG's exposure to foreign currency transaction risk. The fair value of these contracts were net assets of \$23 million and \$24 million as of December 31, 2023 and December 31, 2022, respectively. The potential reduction in PPG's Income before income taxes resulting from the impact of adverse changes in exchange rates on the fair value of its outstanding foreign currency hedge contracts of 10% for European and Canadian currencies and 20% for Asian and Latin American currencies for the years ended December 31, 2023 and 2022 would have been \$402 million and \$304 million, respectively.

PPG had U.S. dollar to euro cross currency swap contracts with a total notional amount of \$475 million and \$775 million as of December 31, 2023 and December 31, 2022, respectively. The fair value of these contracts were net assets of \$33 million and \$88 million as of December 31, 2023 and 2022, respectively. A 10% increase in the value of the euro to the U.S. dollar would have had an unfavorable effect on the fair value of these swap contracts by reducing the value of these instruments by \$46 million and \$73 million at December 31, 2023 and 2022, respectively.

As of December 31, 2023 and 2022, PPG had non-U.S. dollar denominated debt outstanding of \$3.3 billion and \$2.6 billion, respectively. A weakening of the U.S. dollar by 10% against European currencies and by 20% against Asian and South American currencies would have resulted in unrealized translation losses of \$363 million and \$293 million as of December 31, 2023 and 2022, respectively.

Interest Rate Risk

The Company manages its interest rate risk by balancing its exposure to fixed and variable rates while attempting to minimize its interest costs. PPG has interest rate swaps which converted \$375 million and \$525 million of fixed rate debt to variable rate debt as of December 31, 2023 and December 31, 2022, respectively. The fair values of these contracts were liabilities of \$14 million and \$20 million as of December 31, 2023 and 2022, respectively. An increase in variable interest rates of 10% would have lowered the fair values of these swaps and increased interest expense by \$5 million and \$7 million for the periods ended December 31, 2023 and 2022. Considering the debt balance outstanding as of December 31, 2023 and 2022, a 10% increase in interest rates in the U.S., Canada, Mexico and Europe and a 20% increase in interest rates in Asia and South America would have increased annual interest expense associated with PPG's variable rate debt obligations by \$2 million and by \$4 million, respectively. Further, a 10% reduction in interest rates would have increased the fair value of the Company's fixed rate debt by approximately \$96 million and \$116 million as of

December 31, 2023 and 2022, respectively; however, such changes would not have had an effect on PPG's annual Income before income taxes or cash flows.

Item 8. Financial Statements and Supplementary Data

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of PPG Industries, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheet of PPG Industries, Inc. and its subsidiaries (the "Company") as of December 31, 2023 and 2022, and the related consolidated statements of income, of comprehensive income, of shareholders' equity and of cash flows for each of the three years in the period ended December 31, 2023, including the related notes and schedule of valuation and qualifying accounts for each of the three years in the period ended December 31, 2023 appearing under Item 15(a)(2) (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2023, 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, 2023 and 2022, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2023 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2023, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

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 the accompanying Management Report on Establishing and Maintaining Adequate Internal Control Over Financial Reporting. 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

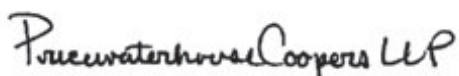
The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial 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 matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Quantitative Goodwill Impairment Test – Traffic Solutions Reporting Unit

As described in Notes 1 and 6 to the consolidated financial statements, the Company's consolidated goodwill balance was \$6,200 million as of December 31, 2023, of which \$391 million relates to the traffic solutions reporting unit. Management tests goodwill for impairment by either performing a qualitative evaluation or a quantitative test, at least annually, or more frequently if an indication of impairment exists. Management's quantitative goodwill impairment testing, if deemed necessary, is performed during the fourth quarter of each year by comparing the estimated fair value of an associated reporting unit as of September 30 to its carrying value. Based on the annual goodwill impairment test performed in the fourth quarter of 2023, management determined that the estimated fair value of the traffic solutions reporting unit was less than its carrying value, resulting in recognition of a goodwill impairment charge of \$158 million in impairment and other related charges, net. The fair value of the traffic solutions reporting unit was estimated by management using a discounted cash flow model. Key assumptions and estimates used in the discounted cash flow model included projected future revenues, a discount rate, operating cash flows, capital expenditures, and a tax rate.

The principal considerations for our determination that performing procedures relating to the quantitative goodwill impairment test of the traffic solutions reporting unit is a critical audit matter are (i) the significant judgment by management when developing the fair value estimate of the traffic solutions reporting unit; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to the projected future revenues 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 quantitative goodwill impairment test, including controls over the valuation of the traffic solutions reporting unit. These procedures also included, among others (i) testing management's process for developing the fair value estimate of the traffic solutions reporting unit; (ii) evaluating the appropriateness of the discounted cash flow model used by management; (iii) testing the completeness and accuracy of underlying data used in the discounted cash flow model; and (iv) evaluating the reasonableness of management's significant assumptions related to the projected future revenues and the discount rate. Evaluating management's assumption related to the projected future revenues involved evaluating whether the assumption used by management was reasonable considering (i) the current and past performance of the traffic solutions reporting unit; (ii) the consistency with external market and industry data; and (iii) whether the assumption was consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of (i) the appropriateness of the discounted cash flow model and (ii) the reasonableness of the discount rate assumption.

The logo for PricewaterhouseCoopers LLP, featuring the company name in a stylized, cursive font.

Pittsburgh, Pennsylvania

February 15, 2023

We have served as the Company's auditor since 2013.

Management Report

Responsibility for Preparation of the Financial Statements and Establishing and Maintaining Adequate Internal Control Over Financial Reporting

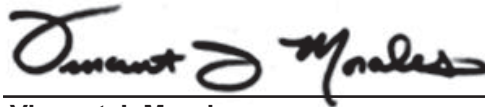
We are responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934, as amended. Because of its inherent limitations, internal control over financial reporting may not prevent or detect 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.

We conducted an evaluation of the effectiveness of the Company's internal control over financial reporting as of December 31, 2023. In making this evaluation, we used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in *Internal Control - Integrated Framework (2013)*. Based on this evaluation we have concluded that, as of December 31, 2023, the Company's internal control over financial reporting was effective.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has issued their report, included on pages 31-32 of this Form 10-K, regarding the Company's internal control over financial reporting.



Timothy M. Knavish
Chairman and Chief Executive Officer
February 15, 2024



Vincent J. Morales
Senior Vice President and Chief Financial Officer
February 15, 2024

Consolidated Statement of Income

(\$ in millions, except per share amounts)	For the Year		
	2023	2022	2021
Net sales	\$18,246	\$17,652	\$16,802
Cost of sales, exclusive of depreciation and amortization	10,745	11,096	10,286
Selling, general and administrative	4,222	3,842	3,780
Depreciation	391	388	389
Amortization	167	166	172
Research and development, net	433	448	439
Interest expense	247	167	121
Interest income	(140)	(54)	(26)
Impairment and other-related charges, net	160	245	21
Pension settlement charge	190	—	50
Asbestos-related claims reserve adjustment	—	—	(133)
Other charges/(income), net	83	(27)	(112)
Income before income taxes	\$1,748	\$1,381	\$1,815
Income tax expense	439	325	374
Income from continuing operations	\$1,309	\$1,056	\$1,441
(Loss)/income from discontinued operations, net of tax	—	(2)	19
Net income attributable to the controlling and noncontrolling interests	\$1,309	\$1,054	\$1,460
Less: Net income attributable to noncontrolling interests	39	28	21
Net income (attributable to PPG)	\$1,270	\$1,026	\$1,439
Amounts attributable to PPG			
Income from continuing operations, net of tax	\$1,270	\$1,028	\$1,420
(Loss)/income from discontinued operations, net of tax	—	(2)	19
Net income (attributable to PPG)	\$1,270	\$1,026	\$1,439
Earnings per common share			
Income from continuing operations, net of tax	\$5.38	\$4.35	\$5.98
(Loss)/income from discontinued operations, net of tax	—	(0.01)	0.08
Net income (attributable to PPG)	\$5.38	\$4.34	\$6.06
Earnings per common share - assuming dilution			
Income from continuing operations, net of tax	\$5.35	\$4.33	\$5.93
(Loss)/income from discontinued operations, net of tax	—	(0.01)	0.08
Net income (attributable to PPG)	\$5.35	\$4.32	\$6.01

Consolidated Statement of Comprehensive Income

(\$ in millions)	For the Year		
	2023	2022	2021
Net income attributable to the controlling and noncontrolling interests	\$1,309	\$1,054	\$1,460
Other comprehensive income/(loss), net of tax			
Defined benefit pension and other postretirement benefits	63	206	174
Unrealized foreign currency translation adjustments	509	(279)	(330)
Other comprehensive income/(loss), net of tax	572	(73)	(156)
Total comprehensive income	\$1,881	\$981	\$1,304
Less: amounts attributable to noncontrolling interests:			
Net income	(39)	(28)	(21)
Unrealized foreign currency translation adjustments	(1)	13	5
Comprehensive income attributable to PPG	\$1,841	\$966	\$1,288

The accompanying notes to the consolidated financial statements are an integral part of these consolidated statements.

Consolidated Balance Sheet

	<i>December 31</i>	
<i>(\$ in millions)</i>	<i>2023</i>	<i>2022</i>
Assets		
Current assets		
Cash and cash equivalents	\$1,514	\$1,099
Short-term investments	75	55
Receivables	3,279	3,303
Inventories	2,127	2,272
Other current assets	436	444
Total current assets	\$7,431	\$7,173
Property, plant and equipment, net	3,644	3,328
Goodwill	6,200	6,078
Identifiable intangible assets, net	2,424	2,414
Deferred income taxes	273	95
Investments	259	244
Operating lease right-of-use assets	832	829
Other assets	584	583
Total	\$21,647	\$20,744
Liabilities and Shareholders' Equity		
Current liabilities		
Accounts payable and accrued liabilities	\$4,467	\$4,087
Restructuring reserves	87	138
Short-term debt and current portion of long-term debt	306	313
Current portion of operating lease liabilities	194	183
Total current liabilities	\$5,054	\$4,721
Long-term debt	5,748	6,503
Operating lease liabilities	622	636
Accrued pensions	588	566
Other postretirement benefits	450	476
Deferred income taxes	508	501
Other liabilities	654	632
Total liabilities	\$13,624	\$14,035
Commitments and contingent liabilities (See Note 15)		
Shareholders' equity		
Common stock	\$969	\$969
Additional paid-in capital	1,202	1,130
Retained earnings	21,500	20,828
Treasury stock, at cost	(13,600)	(13,525)
Accumulated other comprehensive loss	(2,239)	(2,810)
Total PPG shareholders' equity	\$7,832	\$6,592
Noncontrolling interests	191	117
Total shareholders' equity	\$8,023	\$6,709
Total	\$21,647	\$20,744

The accompanying notes to the consolidated financial statements are an integral part of this consolidated statement.

Consolidated Statement of Shareholders' Equity

(\$ in millions)	Common Stock	Additional Paid-In Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Total PPG	Non-controlling Interests	Total
January 1, 2021	\$969	\$1,008	\$19,469	(\$13,158)	(\$2,599)	\$5,689	\$126	\$5,815
Net income attributable to controlling and noncontrolling interests	—	—	1,439	—	—	1,439	21	1,460
Other comprehensive loss, net of tax	—	—	—	—	(151)	(151)	(5)	(156)
Cash dividends	—	—	(536)	—	—	(536)	—	(536)
Purchase of treasury stock	—	—	—	(250)	—	(250)	—	(250)
Issuance of treasury stock	—	48	—	22	—	70	—	70
Stock-based compensation activity	—	25	—	—	—	25	—	25
Dividends paid on subsidiary common stock to noncontrolling interests	—	—	—	—	—	—	(6)	(6)
Reductions in noncontrolling interests	—	—	—	—	—	—	(11)	(11)
December 31, 2021	\$969	\$1,081	\$20,372	(\$13,386)	(\$2,750)	\$6,286	\$125	\$6,411
Net income attributable to controlling and noncontrolling interests	—	—	1,026	—	—	1,026	28	1,054
Other comprehensive loss, net of tax	—	—	—	—	(60)	(60)	(13)	(73)
Cash dividends	—	—	(570)	—	—	(570)	—	(570)
Purchase of treasury stock	—	—	—	(150)	—	(150)	—	(150)
Issuance of treasury stock	—	36	—	11	—	47	—	47
Stock-based compensation activity	—	10	—	—	—	10	—	10
Dividends paid on subsidiary common stock to noncontrolling interests	—	—	—	—	—	—	(13)	(13)
Reductions in noncontrolling interests	—	—	—	—	—	—	(10)	(10)
Other	—	3	—	—	—	3	—	3
December 31, 2022	\$969	\$1,130	\$20,828	(\$13,525)	(\$2,810)	\$6,592	\$117	\$6,709
Net income attributable to controlling and noncontrolling interests	—	—	1,270	—	—	1,270	39	1,309
Other comprehensive income, net of tax	—	—	—	—	571	571	1	572
Cash dividends	—	—	(598)	—	—	(598)	—	(598)
Purchase of treasury stock	—	—	—	(100)	—	(100)	—	(100)
Issuance of treasury stock	—	58	—	25	—	83	—	83
Stock-based compensation activity	—	14	—	—	—	14	—	14
Dividends paid on subsidiary common stock to noncontrolling interests	—	—	—	—	—	—	(21)	(21)
Acquisition of noncontrolling interests	—	—	—	—	—	—	55	55
December 31, 2023	\$969	\$1,202	\$21,500	(\$13,600)	(\$2,239)	\$7,832	\$191	\$8,023

The accompanying notes to the consolidated financial statements are an integral part of this consolidated statement.

Consolidated Statement of Cash Flows

(\$ in millions)	For the Year		
	2023	2022	2021
Operating activities			
Income from continuing operations	\$1,309	\$1,056	\$1,441
Adjustments to reconcile net income to cash from operations:			
Depreciation and amortization	558	554	561
Pension settlement charge	190	—	50
Asbestos-related claims reserve adjustment	—	—	(133)
Impairment and other related charges, net	160	245	21
Stock-based compensation expense	59	35	57
Deferred income taxes	(183)	(157)	35
Cash contributions to pension plans	(46)	(11)	(10)
Cash used for restructuring actions	(57)	(85)	(77)
Change in certain asset and liability accounts (net of acquisitions):			
Receivables	10	(268)	(63)
Inventories	203	(227)	(279)
Other current assets	(53)	(60)	32
Accounts payable and accrued liabilities	130	(8)	295
Noncurrent assets and liabilities, net	(47)	(136)	(109)
Taxes and interest payable	71	143	(64)
Other	107	(118)	(195)
Cash from operating activities	\$2,411	\$963	\$1,562
Investing activities			
Capital expenditures	(\$549)	(\$518)	(\$371)
Business acquisitions, net of cash balances acquired	(109)	(114)	(2,137)
Proceeds from asset sales	36	117	47
Other	66	54	57
Cash used for investing activities	(\$556)	(\$461)	(\$2,404)
Financing activities			
Proceeds from Term Loan Credit Agreement, net of fees	\$550	\$—	\$1,399
Repayment of Term Loan Credit Agreement	(1,100)	(300)	—
Net (payments on)/proceeds from commercial paper and short-term debt	—	(439)	190
Repayment of Term Loan	—	—	(400)
Proceeds from the issuance of debt, net of discounts and fees	—	1,116	692
Repayment of long-term debt	(300)	—	(847)
Repayment of acquired debt	—	(2)	(207)
Purchase of treasury stock	(86)	(190)	(210)
Dividends paid on PPG common stock	(598)	(570)	(536)
Other	(16)	(24)	12
Cash (used for)/from financing activities	(\$1,550)	(\$409)	\$93
Effect of currency exchange rate changes on cash and cash equivalents	110	1	(72)
Net increase/(decrease) in cash and cash equivalents	\$415	\$94	(\$821)
Cash and cash equivalents, beginning of year	\$1,099	\$1,005	\$1,826
Cash and cash equivalents, end of year	\$1,514	\$1,099	\$1,005
Supplemental disclosures of cash flow information:			
Interest paid, net of amount capitalized	\$213	\$156	\$140
Taxes paid, net of refunds	\$495	\$452	\$491
Supplemental disclosure of noncash investing and financing activities:			
Capital expenditures accrued within Accounts payable and accrued liabilities at year-end	\$174	\$76	\$163
Purchases of treasury stock transacted but not yet settled	\$14	\$—	\$40

The accompanying notes to the consolidated financial statements are an integral part of this consolidated statement.

1. Summary of Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements include the accounts of PPG Industries, Inc. (“PPG” or the “Company”) and all subsidiaries, both U.S. and non-U.S., that it controls. PPG owns more than 50% of the voting stock of most of the subsidiaries that it controls. For those consolidated subsidiaries in which the Company’s ownership is less than 100%, the outside shareholders’ interests are shown as noncontrolling interests. Investments in companies in which PPG owns 20% to 50% of the voting stock and has the ability to exercise significant influence over operating and financial policies of the investee are accounted for using the equity method of accounting. As a result, PPG’s share of income or losses from such equity affiliates is included in the consolidated statement of income and PPG’s share of these companies’ shareholders’ equity is included in Investments on the consolidated balance sheet. Transactions between PPG and its subsidiaries are eliminated in consolidation.

Use of Estimates in the Preparation of Financial Statements

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported amounts of income and expenses during the reporting period. Such estimates also include the fair value of assets acquired and liabilities assumed resulting from the allocation of the purchase price related to business combinations consummated. Actual outcomes could differ from those estimates.

Revenue Recognition

Revenue is recognized as performance obligations with the customer are satisfied, at an amount that is determined to be collectible. For the sale of products, this generally occurs at the point in time when control of the Company’s products transfers to the customer based on the agreed upon shipping terms.

Shipping and Handling Costs

Amounts billed to customers for shipping and handling are reported in Net sales in the consolidated statement of income. Shipping and handling costs incurred by the Company for the delivery of goods to customers are included in Cost of sales, exclusive of depreciation and amortization in the consolidated statement of income.

Selling, General and Administrative Costs

Amounts presented in Selling, general and administrative in the consolidated statement of income are comprised of selling, customer service, distribution and advertising costs, as well as the costs of providing corporate-wide functional support in areas such as finance, law, human resources and planning. Distribution costs pertain to the movement and storage of finished goods inventory at company-owned and leased warehouses and other distribution facilities.

Advertising Costs

Advertising costs are charged to expense as incurred and totaled \$285 million, \$252 million and \$243 million in 2023, 2022 and 2021, respectively.

Research and Development

Research and development costs, which consist primarily of employee-related costs, are charged to expense as incurred.

(\$ in millions)	2023	2022	2021
Research and development – total	\$456	\$470	\$463
Less: depreciation on research facilities	23	22	24
Research and development, net	\$433	\$448	\$439

Legal Costs

Legal costs, which primarily include costs associated with acquisition and divestiture transactions, general litigation, environmental regulation compliance, patent and trademark protection and other general corporate purposes, are charged to expense as incurred.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to operating losses and tax credit carryforwards as well as differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in Income tax expense in the consolidated statement of income in the period that includes the enactment date.

A valuation allowance is provided against deferred tax assets in situations where PPG determines it is more likely than not such assets will not ultimately be realized.

PPG does not recognize a tax benefit unless it concludes that it is more likely than not that the benefit will be sustained on audit by the taxing authority based solely on the technical merits of the associated tax position. If the recognition threshold is met, PPG recognizes a tax benefit measured at the largest amount of the tax benefit that, in PPG's judgment, is greater than 50 percent likely to be realized. PPG records interest and penalties related to uncertain tax positions in Income tax expense in the consolidated statement of income.

Foreign Currency Translation

The functional currency of most significant non-U.S. operations is their local currency. Assets and liabilities of those operations are translated into U.S. dollars using year-end exchange rates; income and expenses are translated using the average exchange rates for the reporting period. Unrealized foreign currency translation gains and losses are deferred in Accumulated other comprehensive loss on the consolidated balance sheet.

Cash Equivalents

Cash equivalents are highly liquid investments (valued at cost, which approximates fair value) acquired with an original maturity of three months or less.

Short-term Investments

Short-term investments are highly liquid, high credit quality investments (valued at cost plus accrued interest) that have stated maturities of greater than three months to less than one year. The purchases and sales of these investments are classified as Investing activities in the consolidated statement of cash flows.

Marketable Equity Securities

The Company's investment in marketable equity securities is recorded at fair market value and reported as Other current assets and Investments on the consolidated balance sheet with changes in fair market value recorded in income.

Inventories

Inventories are stated at the lower of cost or net realizable value. Most U.S. inventories are stated at cost, using the last-in, first-out ("LIFO") method of accounting, which does not exceed net realizable value. All other inventories are stated at cost, using the first-in, first-out ("FIFO") method of accounting, which does not exceed net realizable value. PPG determines cost using either average or standard factory costs, which approximate actual costs, excluding certain fixed costs such as depreciation and property taxes. Refer to Note 3, "Working Capital Detail" for further information concerning the Company's inventories.

Derivative Financial Instruments

The Company recognizes all derivative financial instruments (a "derivative") as either assets or liabilities at fair value on the consolidated balance sheet. The accounting for changes in the fair value of a derivative depends on the use of the instrument.

For derivative instruments that are designated and qualify as cash flow hedges, the unrealized gains or losses on the derivatives are recorded in the consolidated statement of comprehensive income. Amounts in Accumulated other comprehensive loss on the consolidated balance sheet are reclassified into Income before income taxes in the consolidated statement of income in the same period or periods during which the hedged transactions are recorded in Income before income taxes in the consolidated statement of income.

For derivative instruments that are designated and qualify as fair value hedges, the change in the fair value of the derivatives are reported in Income before income taxes in the consolidated statement of income, offsetting the gain or loss recognized for the change in fair value of the asset, liability, or firm commitment that is being hedged.

For derivatives, debt or other financial instruments that are designated and qualify as net investment hedges, the gains or losses associated with the financial instruments are reported as translation gains or losses in Accumulated other comprehensive loss on the consolidated balance sheet. Gains and losses in Accumulated other comprehensive loss related to hedges of the Company's net investments in foreign operations are reclassified out of Accumulated other comprehensive loss and recognized in Income before income taxes in the consolidated statement of income upon a substantial liquidation, sale or partial sale of such investments or upon impairment of all or a portion of such investments. The cash flow impact of these instruments is classified as Investing activities in the consolidated statement of cash flows.

Changes in the fair value of derivative instruments not designated as hedges for hedge accounting purposes are recognized in Income before income taxes in the consolidated statement of income in the period of change.

Property, Plant and Equipment

Property, plant and equipment is recorded at cost. Depreciation is computed on a straight-line method based on the estimated useful lives of related assets. Accelerated depreciation expense is recorded when facilities or equipment are subject to abnormal economic conditions, restructuring actions or obsolescence.

The cost of significant improvements that add to productive capacity or extend the lives of properties are capitalized. Costs for repairs and maintenance are charged to expense as incurred. When a capitalized asset is retired or otherwise disposed of, the original cost and related accumulated depreciation balance are removed from the accounts and any related gain or loss is recorded in Income before income taxes in the consolidated statement of income. The amortization cost of finance lease assets is recorded in Depreciation expense in the consolidated statement of income. Property and other long-lived assets are reviewed for impairment whenever events or circumstances indicate that their carrying amounts may not be recoverable. Refer to Note 4, "Property, Plant and Equipment" for further details.

Goodwill and Identifiable Intangible Assets

Goodwill represents the excess of the cost over the fair value of acquired identifiable tangible and intangible assets less liabilities assumed from acquired businesses. Identifiable intangible assets acquired in business combinations are recorded based upon their fair value at the date of acquisition.

PPG is a multinational manufacturer with 10 operating segments (which the Company refers to as "strategic business units") that are organized based on the Company's major products lines. These operating segments are also the Company's reporting units for purposes of testing goodwill for impairment, which is tested at least annually in connection with PPG's strategic planning process or more frequently if an indication of impairment exists. The Company tests goodwill for impairment by either performing a qualitative evaluation or a quantitative test. The qualitative evaluation is an assessment of factors, including reporting unit specific operating results as well as industry, market and general economic conditions, to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount, including goodwill. The Company may elect to bypass this qualitative assessment for some or all of its reporting units and perform a quantitative test. Quantitative goodwill impairment testing, if deemed necessary, is performed during the fourth quarter of each year by comparing the estimated fair value of an associated reporting unit as of September 30 to its carrying value. Fair value is estimated using a discounted cash flow model. Key assumptions and estimates used in the discounted cash flow model include projected future revenues, discount rates, operating cash flows, capital expenditures and tax rates. In 2023, the Company determined that the estimated fair value of the traffic solutions reporting unit was less than its carrying value, resulting in recognition of a goodwill impairment charge of \$158 million in Impairment and other related charges, net in the accompanying consolidated statement of income. Refer to Note 6, "Goodwill and Other Identifiable Intangible Assets" for further details.

The Company has determined that certain acquired trademarks have indefinite useful lives. The Company tests the carrying value of these trademarks for impairment at least annually, or as needed whenever events and circumstances indicate that their carrying amount may not be recoverable. In 2022, due to the adverse economic impacts of Russian military forces invading Ukraine, the Company identified indicators that the carrying value of an indefinite-lived intangible asset and certain definite-lived intangible assets associated with the Company's operations in Russia may not be recoverable, and the carrying value of those assets was assessed for impairment. As a result of this assessment, the Company recorded impairment charges of \$124 million related to the indefinite-lived intangible asset and \$23 million related to definite-lived intangible assets in the consolidated statement of income for the year ended December 31, 2022. Refer to Note 7, "Impairment and Other Related Charges, Net" for additional information.

The annual indefinite-lived intangible asset impairment assessment takes place in the fourth quarter of each year either by completing a qualitative assessment or quantitatively by comparing the estimated fair value of each trademark as of September 30 to its carrying value. Fair value is estimated using the relief from royalty method (a discounted cash flow methodology). The qualitative assessment includes consideration of factors, including revenue relative to the asset being assessed, the operating results of the related business and industry, market and general economic conditions, to determine whether it is more likely than not that the fair value of the asset is less than its carrying amount. In 2023, the annual impairment testing review of indefinite-lived intangibles performed as of September 30, 2023 resulted in the Company recognizing an impairment charge of \$2 million. Refer to Note 6, "Goodwill and Other Identifiable Intangible Assets" for further details.

Identifiable intangible assets with finite lives are amortized on a straight-line basis over their estimated useful lives (1 to 30 years) and are reviewed for impairment whenever events or circumstances indicate that their carrying amount may not be recoverable.

Receivables and Allowances

All trade receivables are reported on the consolidated balance sheet at the outstanding principal adjusted for any allowance for doubtful accounts and any charge offs. The Company provides an allowance for doubtful accounts to

reduce receivables to their estimated net realizable value when it is probable that a loss will be incurred. Those estimates are based on historical collection experience, current regional economic and market conditions, the aging of accounts receivable, assessments of current creditworthiness of customers, and forward-looking information. Refer to Note 20, "Revenue Recognition" for further details.

Supply Chain Finance

PPG has certain voluntary supply chain finance programs with financial intermediaries which provide participating suppliers the option to be paid by the intermediary earlier than the original invoice due date. PPG's responsibility is limited to making payments on the terms originally negotiated with the suppliers, regardless of whether the intermediary pays the supplier in advance of the original due date. The range of payment terms PPG negotiates with suppliers are consistent, regardless of whether a supplier participates in a supply chain finance program. The total amount due to financial intermediaries to settle supplier invoices under supply chain finance programs was \$301 million and \$390 million as of December 31, 2023 and December 31, 2022, respectively. These amounts are included within Accounts payable and accrued liabilities on the accompanying consolidated balance sheet.

Leases

The Company determines if a contract is a lease at the inception of the arrangement. The Company reviews all options to extend, terminate, or purchase its right of use assets at the inception of the lease and accounts for these options when they are reasonably certain of being exercised. Certain real estate leases contain lease and non-lease components, which are accounted for separately. For certain equipment leases, lease and non-lease components are accounted for as a single lease component.

Leases with an initial term of 12 months or less are not recorded on the consolidated balance sheet. Lease expense for these leases is recognized on a straight-line basis over the lease term.

Variable lease expense is based on contractual arrangements with PPG's lessors determined based on external indices or other relevant market factors. In addition, PPG's variable lease expense also includes elements of a contract that do not represent a good or service but for which the lessee is responsible for paying.

Nearly all of PPG's lease contracts do not provide a readily determinable implicit rate. For these contracts, PPG's estimated incremental borrowing rate is based on information available at the inception of the lease.

Product Warranties

The Company accrues for product warranties at the time the associated products are sold based on historical claims experience. The reserve, pretax charges against income and cash outlays for product warranties were not significant to the consolidated financial statements of the Company for any year presented.

Asset Retirement Obligations

An asset retirement obligation represents a legal obligation associated with the retirement of a tangible long-lived asset that is incurred upon the acquisition, construction, development or normal operation of that long-lived asset. PPG recognizes asset retirement obligations in the period in which they are incurred if a reasonable estimate of fair value can be made. The asset retirement obligation is subsequently adjusted for changes in fair value. The associated estimated asset retirement costs are capitalized as part of the carrying amount of the long-lived asset and depreciated over its useful life. PPG's asset retirement obligations are primarily associated with the retirement or closure of certain assets used in PPG's manufacturing process. The accrued asset retirement obligation is recorded in Accounts payable and accrued liabilities and Other liabilities on the consolidated balance sheet and was \$23 million as of both December 31, 2023 and 2022.

PPG's only conditional asset retirement obligation relates to the possible future abatement of asbestos contained in certain PPG production facilities. The asbestos in PPG's production facilities arises from the application of normal and customary building practices in the past when the facilities were constructed. This asbestos is encapsulated in place and, as a result, there is no current legal requirement to abate it. Because there is no requirement to abate, the Company does not have any current plans or an intention to abate and therefore the timing, method and cost of future abatement, if any, are not known. The Company has not recorded an asset retirement obligation associated with asbestos abatement, given the uncertainty concerning the timing of future abatement, if any.

Environmental Contingencies

It is PPG's policy to accrue expenses for environmental contingencies when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. Reserves for environmental contingencies are exclusive of claims against third parties and are generally not discounted.

Assets and Liabilities Held for Sale

The Company classifies assets and liabilities as held for sale (a “disposal group”) when management commits to a plan to sell the disposal group, the sale is probable within one year and the disposal group is available for immediate sale in its present condition. The Company considers various factors, particularly whether actions required to complete the plan indicate it is unlikely that significant changes to the plan will be made or the plan will be withdrawn. Assets held for sale are measured at the lower of carrying value or fair value less costs to sell. Any loss resulting from the measurement is recognized in the period the held-for-sale criteria are met. Conversely, gains are not recognized until the date of the sale. When the disposal group is classified as held for sale, depreciation and amortization ceases and the Company tests the assets for impairment.

Reclassifications

Certain reclassifications of prior years’ data have been made to conform to the current year presentation. These reclassifications had no impact on our previously reported Net income, cash flows or shareholders’ equity.

Accounting Standards Adopted in 2023

Effective January 1, 2023, PPG adopted Accounting Standards Update (“ASU”) No. 2022-04, “Liabilities - Supplier Finance Programs.” This ASU is intended to enhance the transparency surrounding the use of supplier finance programs. The guidance does not affect the recognition, measurement, or financial statement presentation of obligations covered by supplier finance programs.

Accounting Standards to be Adopted in Future Years

In November 2023, the Financial Accounting Standards Board (“FASB”) issued ASU No. 2023-07 “Improvements to Reportable Segment Disclosures (Topic 280)”. This ASU updates current reportable segment disclosure requirements to require disclosures of significant reportable segment expenses that are regularly provided to the Chief Operating Decision Maker (“CODM”) and included within each reported measure of a segment’s profit or loss. This ASU also requires disclosure of the title and position of the individual identified as the CODM and an explanation of how the CODM uses the reported measures of a segment’s profit or loss in assessing segment performance and deciding how to allocate resources. This ASU will be effective for the annual period ending December 31, 2024. Adoption of this ASU will result in additional disclosure, but will not impact PPG’s consolidated financial position, results of operations or cash flows.

In December 2023, the FASB issued ASU No. 2023-09 “Improvements to Income Tax Disclosures (Topic 740)”. This ASU updates current income tax disclosure requirements to require disclosures of specific categories of information within the effective tax rate reconciliation, as well as disclosure of income taxes paid disaggregated by jurisdiction. This ASU will be effective for the annual period ending December 31, 2025. Adoption of this ASU will result in additional disclosure, but will not impact PPG’s consolidated financial position, results of operations or cash flows.

2. Acquisitions

The pro-forma impact of the following acquisition on PPG’s sales and results of operations, including the pro-forma effect of events that are directly attributable to this acquisition, was not significant.

Tikkurila

On June 10, 2021, PPG completed its tender offer for all of the outstanding shares of Tikkurila Oyj (“Tikkurila”). Tikkurila is a leading Nordic producer and distributor of decorative paint and coatings, including an industrial paint business that produces paints and coatings for the wood and metal industries, among others. Immediately prior to the June 10, 2021 acquisition date, PPG owned 9.3% of Tikkurila’s issued and outstanding shares. Immediately following the acquisition date, PPG owned 97.1% of Tikkurila’s issued and outstanding shares. PPG continued to acquire the remaining shares not tendered during the tender offer period through a squeeze out process, ultimately achieving 100% ownership of Tikkurila’s outstanding shares during the fourth quarter of 2021.

The results of this business since the date of acquisition have been reported within two operating segments: the architectural coatings – EMEA business and the industrial coatings business. The architectural coatings – EMEA business is included within the Performance Coatings reportable business segment and the industrial coatings business is included within the Industrial Coatings reportable business segment.

3. Working Capital Detail

(\$ in millions)	2023	2022
Receivables		
Trade - net	\$2,881	\$2,824
Other - net	398	479
Total	\$3,279	\$3,303
Inventories⁽¹⁾		
Finished products	\$1,197	\$1,209
Work in process	236	238
Raw materials	640	784
Supplies	54	41
Total	\$2,127	\$2,272
Accounts payable and accrued liabilities		
Trade	\$2,612	\$2,538
Accrued payroll	674	501
Customer rebates	414	377
Other postretirement and pension benefits	96	77
Income taxes	128	37
Other	543	557
Total	\$4,467	\$4,087

(1) Inventories valued using the LIFO method of inventory valuation comprised 20% and 21% of total gross inventory values as of December 31, 2023 and 2022, respectively. If the FIFO method of inventory valuation had been used, inventories would have been \$249 million and \$272 million higher as of December 31, 2023 and 2022, respectively.

4. Property, Plant and Equipment

(\$ in millions)	Useful Lives (years)	2023	2022
Land and land improvements	1-30	\$572	\$548
Buildings	20-40	1,908	1,774
Machinery and equipment	5-25	4,157	3,960
Other	3-20	1,287	1,203
Construction in progress		683	492
Total		\$8,607	\$7,977
Less: accumulated depreciation		4,963	4,649
Net		\$3,644	\$3,328

5. Investments

(\$ in millions)	2023	2022
Investments in equity affiliates	\$141	\$134
Marketable equity securities (See Note 11)	74	61
Other	44	49
Total	\$259	\$244

Investments in equity affiliates represent PPG's ownership interests in entities between 20% and 50% that manufacture and sell coatings and certain chemicals.

PPG's share of undistributed net earnings of equity affiliates was \$21 million, \$25 million and \$15 million in 2023, 2022 and 2021, respectively. Dividends received from equity affiliates were \$17 million, \$17 million and \$9 million in 2023, 2022 and 2021, respectively.

6. Goodwill and Other Identifiable Intangible Assets

Goodwill			
(\$ in millions)	Performance Coatings	Industrial Coatings	Total
January 1, 2022	\$5,034	\$1,214	\$6,248
Acquisitions, including purchase accounting adjustments	31	15	46
Divestitures	(40)	—	(40)
Foreign currency impact	(144)	(32)	(176)
December 31, 2022	\$4,881	\$1,197	\$6,078
Acquisitions, including purchase accounting adjustments	126	13	139
Divestitures	(5)	—	(5)
Foreign currency impact	150	(4)	146
Goodwill impairment	(158)	—	(158)
December 31, 2023	\$4,994	\$1,206	\$6,200

In the fourth quarter, the Company tests the carrying value of goodwill for impairment, as discussed in Note 1. “Summary of Significant Accounting Policies.” Based on the annual goodwill impairment test performed in the fourth quarter 2023, the Company determined that the estimated fair value of the traffic solutions reporting unit was less than its carrying value, resulting in recognition of a goodwill impairment charge of \$158 million in Impairment and other related charges, net in the accompanying consolidated statements of income. After recording the goodwill impairment charge of \$158 million, the remaining goodwill balance recorded for the traffic solutions reporting unit was \$391 million as of December 31, 2023. The fair value of the traffic solutions reporting unit was estimated using a discounted cash flow model. Key assumptions and estimates used in the discounted cash flow model included projected future revenues, a discount rate, operating cash flows, capital expenditures, and a tax rate. The decline in the fair value of the traffic solutions reporting unit compared to prior periods was primarily due to an increase in the weighted average cost of capital (discount rate assumption) reflecting the current interest rate environment. In addition, the fair value was impacted by a decline in the reporting unit’s long-term cash generation forecast due to the highly inflationary environment in Argentina and the fourth quarter 2023 divestitures of its European and Australian businesses.

In 2022 and 2021, the annual impairment testing of goodwill did not result in impairment of any of the Company’s reporting units. As of December 31, 2023, accumulated goodwill impairment losses totaled \$158 million.

Identifiable Intangible Assets						
(\$ in millions)	December 31, 2023			December 31, 2022		
	Gross Carrying Amount	Accumulated Amortization	Net	Gross Carrying Amount	Accumulated Amortization	Net
Indefinite-Lived Identifiable Intangible Assets						
Trademarks	\$1,442	\$—	\$1,442	\$1,325	\$—	\$1,325
Definite-Lived Identifiable Intangible Assets						
Acquired technology	\$845	(\$678)	\$167	\$827	(\$636)	\$191
Customer-related	1,933	(1,259)	674	1,855	(1,112)	743
Trade names	319	(180)	139	311	(158)	153
Other	50	(48)	2	50	(48)	2
Total Definite Lived Intangible Assets	\$3,147	(\$2,165)	\$982	\$3,043	(\$1,954)	\$1,089
Total Identifiable Intangible Assets	\$4,589	(\$2,165)	\$2,424	\$4,368	(\$1,954)	\$2,414

In the fourth quarter, the Company tests the carrying value of indefinite-lived trademarks for impairment, as discussed in Note 1, “Summary of Significant Accounting Policies.” In conjunction with both the 2023 and 2022 annual impairment tests, the Company determined that the estimated fair value of certain trademarks in the Performance Coatings segment was less than the carrying value, resulting in recognition of impairment charges of \$2 million and \$4 million, respectively, in Impairment and other related charges, net in the accompanying consolidated statement of income. In 2021, the annual impairment testing review of indefinite-lived intangibles did not result in an impairment.

In the first quarter 2022, due to the adverse economic impacts of the Russian invasion in Ukraine, the Company recognized \$147 million of Impairment and other related charges, net in the consolidated statement of income related to certain definite-lived and indefinite-lived intangible assets in the Performance Coatings segment. Refer to Note 7, “Impairment and Other Related Charges, Net” for further details.

Aggregate amortization expense was \$167 million, \$166 million and \$172 million in 2023, 2022 and 2021, respectively. In the fourth quarter 2023, the Company recognized accelerated amortization expense of \$6 million related to the exit of a non-core business.

(\$ in millions)	2024	2025	2026	2027	2028
Estimated future amortization expense	\$147	\$128	\$107	\$96	\$83

7. Impairment and Other Related Charges, Net

In 2023, the Company recorded a goodwill impairment charge for the traffic solutions reporting unit and indefinite-lived intangible asset impairment charges related to certain trademarks. In 2022, the Company recorded indefinite-lived intangible asset impairment charges for certain trademarks. Refer to Note 6, "Goodwill and Intangible Assets" for further detail related to these charges, which are included in Impairment and other related charges, net in the accompanying consolidated statement of income.

Wind Down of Russia Operations

In the first quarter 2022, Russian military forces invaded Ukraine. This military action had significant and immediate adverse economic impacts on businesses operating in Russia and Ukraine. Based on deteriorating business conditions and regulatory restrictions, including the impact of economic sanctions imposed on Russia by the United States, the European Union and other governments, PPG immediately ceased sales to Russian state-owned entities, announced that the Company would cease all new investments in Russia and commenced actions to wind down most of the Company's operations in Russia.

Based on this change in facts and circumstances, the long-term cash flow forecast for the Company's operations in Russia was significantly reduced. This reduction in the long-term cash flow forecast indicated that the carrying amounts of long-lived assets and certain indefinite-lived intangible assets associated with the Company's operations in Russia may not be recoverable, and the carrying value of these assets was tested for impairment. Additionally, the Company evaluated trade receivables for estimated future credit losses, inventories for declines in net realizable value and other current assets for impairment in light of the deteriorating economic conditions in Russia and Ukraine. As a result, during the three months ended March 31, 2022, the Company recognized \$290 million of Impairment and other related charges, net in the consolidated statement of income, comprised of \$201 million of long-lived asset impairment charges and \$89 million of other related charges.

The \$201 million of long-lived asset impairment charges recorded during first quarter 2022 was comprised of \$124 million related to indefinite-lived intangible assets, \$54 million related to property, plant and equipment, net and \$23 million related to definite-lived intangible assets. The \$89 million of other related charges represented reserves established for receivables and other current assets and the write-down of inventories impacted by the adverse economic consequences of the Russian invasion of Ukraine.

Subsequently, the Company released a portion of the previously established reserves due to the collection of certain trade receivables and recorded recoveries due to the realization of certain previously written-down inventories, resulting in recognition of income of \$63 million within Impairment and other related charges, net.

The Company divested its legacy industrial Russian operations during 2023 and continues to diligently work towards exiting Russia, including a possible sale of its remaining Russian business or controlled withdrawal from the Russia market.

During both the years ended December 31, 2023 and 2022, net sales in Russia represented approximately 1% of PPG net sales.

Businesses Classified as Held for Sale

The Company recorded impairment charges of \$14 million and \$21 million in Impairment and other related charges, net in the consolidated statement of income for the years ended December 31, 2022 and 2021, respectively, related to certain smaller, non-strategic businesses. PPG committed to plans to sell these business and they were reclassified as held for sale. The revenue of these businesses represents less than 1% of PPG annual net sales. The impairment charges recorded represent the excess net book value of the net assets over the anticipated sales proceeds less costs to sell. The Company did not record any impairment charges related to businesses classified as held for sale during 2023.

8. Business Restructuring

The Company records restructuring liabilities that represent charges incurred in connection with consolidations of certain operations, including operations from acquisitions, as well as headcount reduction programs. These charges consist primarily of severance costs and certain other cash costs. As a result of these programs, the Company will also incur incremental non-cash accelerated depreciation expense for certain assets due to their reduced expected asset life. These charges are not allocated to the Company's reportable business segments. Refer to Note 21, "Reportable Business Segment Information" for additional information.

In 2023, the Company approved business restructuring actions to reduce costs and improve the profitability of the overall business portfolio. The majority of these restructuring actions are expected to be completed by the end of 2024.

In 2022, the Company approved a business restructuring plan which included actions to reduce its global cost structure in response to current economic conditions, including softening demand in Europe and lower than expected demand recovery in China. The Company performed a comprehensive evaluation to identify opportunities to reduce costs and improve the profitability of the overall business portfolio. The program includes actions to right-size employee headcount, reductions in functional and administrative costs and other cost savings actions. The majority of these restructuring actions are expected to be completed by the end of 2024.

In 2021, the Company approved business restructuring actions related to recent acquisitions targeting further consolidation of its manufacturing footprint and headcount reductions. The majority of these restructuring actions are expected to be completed by the end of 2024.

The following table summarizes restructuring reserve activity for the years ended December 31, 2023 and 2022:

(\$ in millions)	Total Reserve	
	2023	2022
January 1	\$169	\$231
Approved restructuring actions	33	84
Release of prior reserves and other adjustments ^(a)	(35)	(51)
Cash payments	(57)	(85)
Foreign currency impact	3	(10)
December 31	\$113	\$169

(a) Certain releases were recorded to reflect the current estimate of costs to complete planned business restructuring actions.

9. Leases

PPG leases certain retail paint stores, warehouses, distribution facilities, office space, fleet vehicles and equipment.

The components of lease expense for the years ended December 31, 2023, 2022 and 2021 were as follows:

(\$ in millions)	Classification in the Consolidated Statement of Income	2023	2022	2021
Operating lease cost	Cost of sales, exclusive of depreciation and amortization	\$46	\$43	\$41
Operating lease cost	Selling, general and administrative	220	216	219
Total operating lease cost		\$266	\$259	\$260
Finance lease cost:				
Amortization of right-of-use assets	Depreciation	\$2	\$2	\$2
Interest on lease liabilities	Interest expense	1	1	1
Total finance lease cost		\$3	\$3	\$3
Total lease cost		\$269	\$262	\$263

Total operating lease cost for the years ended December 31, 2023, 2022 and 2021 is inclusive of the following:

(\$ in millions)	2023	2022	2021
Variable lease costs	\$20	\$18	\$18
Short-term lease costs	\$20	\$22	\$16

The lease amounts included in the consolidated balance sheet as of December 31, 2023 and 2022 were as follows:

(\$ in millions)	Classification on the Consolidated Balance Sheet	2023	2022
Assets:			
Operating	Operating lease right-of-use assets	\$832	\$829
Finance ⁽¹⁾	Property, plant, and equipment, net	14	15
Total leased assets		\$846	\$844
Liabilities:			
Current			
Operating	Current portion of operating lease liabilities	\$194	\$183
Finance	Short-term debt and current portion of long-term debt	2	3
Noncurrent			
Operating	Operating lease liabilities	\$622	\$636
Finance	Long-term debt	6	7
Total lease liabilities		\$824	\$829

(1) Net of accumulated depreciation of \$15 million and \$14 million as of December 31, 2023 and 2022, respectively.

Supplemental cash flow information related to leases for the years ended December 31, 2023, 2022 and 2021 was as follows:

(\$ in millions)	2023	2022	2021
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash flows paid for operating leases	\$224	\$218	\$224
Operating cash flows paid for finance leases	\$1	\$1	\$1
Financing cash flows paid for finance leases	\$3	\$2	\$3
Right-of-use assets obtained in exchange for lease obligations:			
Operating leases	\$174	\$161	\$253
Finance leases	\$1	\$3	\$—

Lease terms and discount rates as of December 31, 2023, 2022 and 2021 were as follows:

	2023	2022	2021
Weighted-average remaining lease term (in years)			
Operating leases	6.2	6.7	7.1
Finance leases	9.5	9.0	6.4
Weighted-average discount rate			
Operating leases	3.2%	2.6%	2.1%
Finance leases	5.9%	5.7%	5.8%

As of December 31, 2023, maturities of lease liabilities were as follows:

(\$ in millions)	Operating Leases	Finance Leases
2024	\$216	\$2
2025	176	2
2026	137	2
2027	103	1
2028	80	1
Thereafter	184	1
Total lease payments	\$896	\$9
Less: Interest	80	1
Total lease obligations	\$816	\$8

10. Borrowings and Lines of Credit

Long-term Debt Obligations

(\$ in millions)	Maturity Date	2023	2022
3.2% notes (\$300) ⁽¹⁾	2023	\$—	\$300
Term Loan Credit Agreement, due 2024 (\$1,400)	2024	—	1,099
2.4% notes (\$300)	2024	299	299
0.875% notes (€600)	2025	660	639
1.875% notes (€300)	2025	330	319
1.2% notes (\$700)	2026	696	694
Term Loan Credit Agreement, due 2026 (€500)	2026	552	—
1.4% notes (€600)	2027	659	638
3.75% notes (\$800) ⁽²⁾	2028	808	809
2.5% notes (€80)	2029	87	85
2.8% notes (\$300)	2029	298	298
2.75% notes (€700)	2029	768	743
2.55% notes (\$300)	2030	297	297
1.95% note (€50)	2037	54	52
7.7% notes (\$176)	2038	174	174
5.5% notes (\$250)	2040	247	247
3.0% notes (€120)	2044	126	122
Various other non-U.S. debt	Various	1	1
Finance lease obligations	Various	8	10
Impact of derivatives on debt ⁽³⁾	N/A	(14)	(20)
Total		\$6,050	\$6,806
Less payments due within one year	N/A	302	303
Long-term debt		\$5,748	\$6,503

- (1) In February 2018, PPG entered into interest rate swaps which converted \$150 million of the notes from a fixed interest rate to a floating interest rate based on the three month London Interbank Offered Rate (LIBOR). The impact of the derivative on the notes represents the fair value adjustment of the debt. The average effective interest rate for the portion of the notes impacted by the swaps was 5.1% and 2.2% for the years ended December 31, 2023 and 2022, respectively. In March 2023 the obligation was repaid and the associated interest rate swaps were settled. Refer to Note 11, "Financial Instruments, Hedging Activities and Fair Value Measurements" for additional information.
- (2) In February 2018, PPG entered into interest rate swaps which converted \$375 million of the notes from a fixed interest rate to a floating interest rate based on the three month LIBOR. The impact of the derivative on the notes represents the fair value adjustment of the debt. The average effective interest rate for the portion of the notes impacted by the swaps was 6.2% and 2.6% for the years ended December 31, 2023 and 2022, respectively. Refer to Note 11, "Financial Instruments, Hedging Activities and Fair Value Measurements" for additional information.
- (3) Fair value adjustment of the 3.2% \$300 million notes and 3.75% \$800 million notes as a result of fair value hedge accounting treatment related to the outstanding interest rate swaps as of December 31, 2023 and 2022, respectively. In March 2023, the 3.2% \$300 million notes were repaid and the associated interest rate swaps were settled. Refer to Note 11, "Financial Instruments, Hedging Activities and Fair Value Measurements" for additional information.

Credit Agreements

In April 2023, PPG entered into a €500 million term loan credit agreement (the "Term Loan"). The Term Loan provides the Company with the ability to increase the size of the loan by an amount not to exceed €250 million. The Term Loan contains covenants that are consistent with those in the Credit Agreement discussed below and that are usual and customary restrictive covenants for facilities of its type, which include, with specified exceptions, limitations on the Company's ability to create liens or other encumbrances, to enter into sale and leaseback transactions and to enter into consolidations, mergers or transfers of all or substantially all of its assets. The Term Loan terminates and all amounts outstanding are payable in April 2026. In April 2023, PPG borrowed €500 million under the Term Loan. In December 2023, PPG obtained lender commitments sufficient to increase the size of the Term Loan by €250 million. In January 2024, PPG borrowed the additional €250 million. The Term Loan is denominated in euro and has been designated as a hedge of the net investment in the Company's European operations. For more information, refer to Note 11 "Financial Instruments, Hedging Activities and Fair Value Measurements."

In March 2023, PPG amended its five-year credit agreement (the "Credit Agreement") dated as of August 30, 2019. The amendments to the Credit Agreement replace the LIBOR-based reference interest rate option with a reference interest rate option based upon Term SOFR. The other terms of the Credit Agreement remained unchanged. In July 2023, PPG amended and restated the Credit Agreement, extending the term through July 27, 2028. The amended and restated Credit Agreement provides for a \$2.3 billion unsecured revolving credit facility. The Company has the ability to increase the size of the Credit Agreement by up to an additional \$750 million, subject to the receipt of lender commitments and other conditions precedent. The Company has the right, subject to certain conditions set forth in the Credit Agreement, to designate certain subsidiaries of the Company as borrowers under the Credit Agreement. In connection with any such

designation, the Company is required to guarantee the obligations of any such subsidiaries under the Credit Agreement. There were no amounts outstanding under the Credit Agreement as of December 31, 2023 and December 31, 2022.

Borrowings under the Credit Agreement may be made in U.S. Dollars or in euros. The Credit Agreement provides that loans will bear interest at rates based, at the Company's option, on one of two specified base rates plus a margin based on certain formulas defined in the Credit Agreement. Additionally, the Credit Agreement contains a Commitment Fee, as defined in the Credit Agreement, on the amount of unused commitments under the Credit Agreement ranging from 0.060% to 0.125% per annum.

The Credit Agreement also supports the Company's commercial paper borrowings which are classified as long-term based on PPG's intent and ability to refinance these borrowings on a long-term basis. There were no commercial paper borrowings outstanding as of both December 31, 2023 and December 31, 2022.

The Credit Agreement contains usual and customary restrictive covenants for facilities of its type, which include, with specified exceptions, limitations on the Company's ability to create liens or other encumbrances, to enter into sale and leaseback transactions and to enter into consolidations, mergers or transfers of all or substantially all of its assets. The Credit Agreement also requires the Company to maintain a ratio of Total Indebtedness to Total Capitalization, as defined in the Credit Agreement, of 60% or less; provided, that for any fiscal quarter in which the Company has made an acquisition for consideration in excess of \$1 billion and for the next five fiscal quarters thereafter, the ratio of Total Indebtedness to Total Capitalization may not exceed 65% at any time. As of December 31, 2023, Total Indebtedness to Total Capitalization as defined under the Credit Agreement was 42%.

The Credit Agreement contains, among other things, customary events of default that would permit the lenders to accelerate the loans, including the failure to make timely payments when due under the Credit Agreement or other material indebtedness, the failure to satisfy covenants contained in the Credit Agreement, a change in control of the Company and specified events of bankruptcy and insolvency.

Other Long-term Debt Activities

In March 2023, PPG's \$300 million 3.2% notes matured, and the Company repaid this obligation using cash on hand.

In May 2022, PPG completed a public offering of €300 million 1.875% Notes due 2025 and €700 million 2.750% Notes due 2029. These notes were issued pursuant to PPG's existing shelf registration statement and pursuant to an indenture between the Company and The Bank of New York Mellon Trust Company, N.A., as trustee, as supplemented (the "2022 Indenture"). The 2022 Indenture governing these notes contains covenants that limit the Company's ability to, among other things, incur certain liens securing indebtedness, engage in certain sale-leaseback transactions, and enter into certain consolidations, mergers, conveyances, transfers or leases of all or substantially all the Company's assets. The terms of these notes also require the Company to make an offer to repurchase Notes upon a Change of Control Triggering Event (as defined in the 2022 Indenture) at a price equal to 101% of their principal amount plus accrued and unpaid interest. The Company may issue additional debt from time to time pursuant to the Indenture. The aggregate cash proceeds from the notes, net of discounts and fees, was \$1,061 million. The notes are denominated in euro and have been designated as hedges of net investments in the Company's European operations. Refer to Note 11 "Financial Instruments, Hedging Activities and Fair Value Measurements." for additional information.

In March 2022, PPG privately placed a 15-year €50 million 1.95% fixed interest note. This note contains covenants materially consistent with the 1.200% notes discussed below. This debt arrangement is denominated in euros and has been designated as a net investment hedge of the Company's European operations. Refer to Note 11 "Financial Instruments, Hedging Activities and Fair Value Measurements" for additional information.

In December 2021, PPG completed an early redemption of the €600 million 0.875% notes due March 2022 using cash on hand.

In the second quarter of 2021, two of PPG's long-term debt obligations matured; \$134 million 9% non-callable debentures and non-U.S. debt of €30 million. The Company paid \$170 million to settle these obligations using cash on hand.

In March 2021, PPG completed a public offering of \$700 million aggregate principal amount of 1.200% notes due 2026. These notes were issued pursuant to PPG's existing shelf registration statement and pursuant to the Indenture between the Company and the Bank of New York Mellon Trust Company, N.A., as trustee, as supplemented (the "2021 Indenture"). The 2021 Indenture governing these notes contains covenants that limit the Company's ability to, among other things, incur certain liens securing indebtedness, engage in certain sale-leaseback transactions, and enter into certain consolidations, mergers, conveyances, transfers or leases of all or substantially all the Company's assets. The terms of these notes also require the Company to make an offer to repurchase the notes upon a Change of Control Triggering Event (as defined in the 2021 Indenture) at a price equal to 101% of their principal amount plus accrued and unpaid interest. The Company may issue additional debt from time to time pursuant to the 2021 Indenture. The aggregate cash proceeds from the notes, net of discounts and fees, was \$692 million.

In February 2021, PPG entered into a \$2.0 billion Term Loan Credit Agreement (the "Term Loan Credit Agreement") to finance the Company's acquisition of Tikkurila, and to pay fees, costs and expenses related thereto. The Term Loan Credit Agreement provided the Company with the ability to borrow up to an aggregate principal amount of \$2.0 billion on an unsecured basis. In addition to the amounts borrowed to finance the acquisition of Tikkurila, the Term Loan Credit Agreement allowed the Company to make up to eleven additional borrowings prior to December 31, 2021, to be used for working capital and general corporate purposes. The Term Loan Credit Agreement contains covenants that are consistent with those in the Credit Agreement discussed below and that are usual and customary restrictive covenants for facilities of its type, which include, with specified exceptions, limitations on the Company's ability to create liens or other encumbrances, to enter into sale and leaseback transactions and to enter into consolidations, mergers or transfers of all or substantially all of its assets. The Term Loan Credit Agreement matures and all outstanding borrowings are due and payable on the third anniversary of the date of the initial borrowing under the Agreement. In June 2021, PPG borrowed \$700 million under Term Loan Credit Agreement to finance the Company's acquisition of Tikkurila, and to pay fees, costs and expenses related thereto. In December 2021, PPG borrowed an additional \$700 million under the Term Loan Credit Agreement. In March 2023, PPG amended the Term Loan Credit Agreement to replace the LIBOR-based reference interest rate option with a reference interest rate option based upon Term Secured Overnight Financing Rate ("SOFR"). The other terms of the Term Loan Credit Agreement remain unchanged. In 2022 and 2023, PPG repaid \$300 million and \$1.1 billion, respectively, of the Term Loan Credit Agreement using cash on hand. The Term Loan Credit Agreement was fully repaid as of December 31, 2023. Borrowings of \$1.1 billion were outstanding under the Term Loan Credit Agreement as of December 31, 2022.

Restrictive Covenants and Cross-Default Provisions

As of December 31, 2023, PPG was in full compliance with the restrictive covenants under its various credit agreements, loan agreements and indentures.

Additionally, the Company's Credit Agreement contains customary cross-default provisions. These provisions provide that a default on a debt service payment of \$100 million or more for longer than the grace period provided under another agreement may result in an event of default under this agreement. None of the Company's primary debt obligations are secured or guaranteed by the Company's affiliates.

Long-term Debt Maturities

<i>(\$ in millions)</i>	<i>Maturity per year</i>
2024	\$302
2025	\$989
2026	\$1,250
2027	\$662
2028	\$784
Thereafter	\$2,063

Short-term Debt Obligations

<i>(\$ in millions)</i>	<i>2023</i>	<i>2022</i>
Various, weighted average 2.4% and 2.7% as of December 31, 2023 and 2022, respectively.	\$4	\$10

Lines of Credit, Letters of Credit and Surety Bonds

PPG's non-U.S. operations have uncommitted lines of credit totaling \$491 million of which none was used as of December 31, 2023. These uncommitted lines of credit are subject to cancellation at any time and are generally not subject to any commitment fees.

The Company had outstanding letters of credit and surety bonds of \$232 million and \$231 million as of December 31, 2023 and 2022, respectively. The letters of credit secure the Company's performance to third parties under certain self-insurance programs and other commitments made in the ordinary course of business. The Company does not believe any loss related to these letters of credit or surety bonds is likely.

11. Financial Instruments, Hedging Activities and Fair Value Measurements

Financial instruments include cash and cash equivalents, short-term investments, cash held in escrow, marketable equity securities, accounts receivable, company-owned life insurance, accounts payable, short-term and long-term debt instruments, and derivatives. The fair values of these financial instruments approximated their carrying values at December 31, 2023 and 2022, in the aggregate, except for long-term debt instruments.

Hedging Activities

The Company has exposure to market risk from changes in foreign currency exchange rates and interest rates. As a result, financial instruments, including derivatives, have been used to hedge a portion of these underlying economic exposures. Certain of these instruments qualify as fair value, cash flow, and net investment hedges upon meeting the requisite criteria, including effectiveness of offsetting hedged or underlying exposures. Changes in the fair value of derivatives that do not qualify for hedge accounting are recognized in Income before income taxes in the period incurred.

PPG's policies do not permit speculative use of derivative financial instruments. PPG enters into derivative financial instruments with high credit quality counterparties and diversifies its positions among such counterparties in order to reduce its exposure to credit losses. The Company did not realize a credit loss on derivatives during the three-year period ended December 31, 2023.

All of PPG's outstanding derivative instruments are subject to accelerated settlement in the event of PPG's failure to meet its debt or payment obligations under the terms of the instruments' contractual provisions. In addition, if the Company would be acquired and its payment obligations under its derivative instruments' contractual arrangements are not assumed by the acquirer, or if PPG would enter into bankruptcy, receivership or reorganization proceedings, its outstanding derivative instruments would also be subject to accelerated settlement.

In 2023 and 2022, there were no derivative instruments de-designated or discontinued as a hedging instrument. There were no gains or losses deferred in Accumulated other comprehensive loss on the consolidated balance sheet that were reclassified to Income before income taxes in the consolidated statement of income during the three-year period ended December 31, 2023 related to hedges of anticipated transactions that were no longer expected to occur.

Fair Value Hedges

The Company uses interest rate swaps from time to time to manage its exposure to changing interest rates. When outstanding, the interest rate swaps are typically designated as fair value hedges of certain outstanding debt obligations of the Company and are recorded at fair value.

PPG has interest rate swaps which converted \$375 million and \$525 million of fixed rate debt to variable rate debt as of December 31, 2023 and December 31, 2022, respectively. The swaps are designated as fair value hedges and are carried at fair value. Changes in the fair value of these swaps and changes in the fair value of the related debt are recorded in Interest expense in the accompanying consolidated statement of income. The fair value of these interest rate swaps were liabilities of \$14 million and \$20 million at December 31, 2023 and 2022, respectively.

Cash Flow Hedges

At times, PPG designates certain foreign currency forward contracts as cash flow hedges of the Company's exposure to variability in exchange rates on third party transactions denominated in foreign currencies. There were no outstanding cash flow hedges at December 31, 2023 and December 31, 2022, respectively.

Net Investment Hedges

PPG uses cross currency swaps and foreign currency euro-denominated debt to hedge a significant portion of its net investment in its European operations, as follows:

PPG had U.S. dollar to euro cross currency swap contracts with total notional amounts of \$475 million and \$775 million as of December 31, 2023 and December 31, 2022, respectively, and designated these contracts as hedges of the Company's net investment in its European operations. During the term of these contracts, PPG will receive payment in U.S. dollars and make payments in euros to the counterparties. As of December 31, 2023 and 2022, the fair value of these contracts were net assets of \$33 million and \$88 million, respectively.

At December 31, 2023 and 2022, PPG had designated €3.0 billion and €2.5 billion, respectively, of euro-denominated borrowings as hedges of a portion of its net investment in the Company's European operations. The carrying value of these instruments at December 31, 2023 and 2022 was \$3.3 billion and \$2.6 billion, respectively.

There were no foreign currency forward contracts designated as net investment hedges used or outstanding as of and for the periods ended December 31, 2023, 2022 and 2021.

Other Financial Instruments

PPG uses foreign currency forward contracts to manage net transaction exposures that do not qualify for hedge accounting; therefore, the change in the fair value of these instruments is recorded in Other charges/(income), net in the consolidated statement of income in the period of change. Underlying notional amounts related to these foreign currency forward contracts were \$2.5 billion and \$1.8 billion at December 31, 2023 and 2022, respectively. The fair values of these contracts were net assets of \$23 million and \$24 million as of December 31, 2023 and 2022, respectively.

Gains/Losses Deferred in Accumulated Other Comprehensive Loss

As of December 31, 2023 and 2022, the Company had accumulated pretax unrealized translation gains in Accumulated other comprehensive loss on the consolidated balance sheet related to the euro-denominated borrowings, foreign currency forward contracts, and the cross currency swaps of \$223 million and \$327 million, respectively.

The following table summarizes the amount of gains/(losses) deferred in Other comprehensive (loss)/income ("OCI") and the amount and location of gains recognized within the consolidated statement of income related to derivative and debt financial instruments for the years ended December 31, 2023, 2022 and 2021. All dollar amounts are shown on a pretax basis.

(\$ in millions)	2023		2022		2021		Caption in Consolidated Statement of Income
	(Loss)/Gain Deferred in OCI	(Loss)/Gain Recognized	Gain Deferred in OCI	Gain Recognized	Gain Deferred in OCI	Gain Recognized	
Fair Value							
Interest rate swaps		(\$10)		\$8		\$15	Interest expense
Total Fair Value		(\$10)		\$8		\$15	
Net Investment							
Cross currency swaps	(\$15)	\$12	\$38	\$16	\$53	\$13	Interest expense
Foreign denominated debt	(89)	—	85	—	173	—	
Total Net Investment	(\$104)	\$12	\$123	\$16	\$226	\$13	
Economic							
Foreign currency forward contracts		\$49		\$43		\$23	Other charges/(income), net

Fair Value Measurements

The Company follows a fair value measurement hierarchy to measure its assets and liabilities. As of December 31, 2023 and 2022, respectively, the assets and liabilities measured at fair value on a recurring basis were cash equivalents, equity securities and derivatives. In addition, the Company measures its pension plan assets at fair value (see Note 14, "Employee Benefit Plans" for further details). The Company's financial assets and liabilities are measured using inputs from the following three levels:

Level 1 inputs are quoted prices in active markets for identical assets and liabilities that the Company has the ability to access at the measurement date. Level 1 inputs are considered to be the most reliable evidence of fair value as they are based on unadjusted quoted market prices from various financial information service providers and securities exchanges.

Level 2 inputs are directly or indirectly observable prices that are not quoted on active exchanges, which include quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable for the asset or liability and inputs that are derived principally from or corroborated by observable market data by correlation or other means. The fair values of the derivative instruments reflect the instruments' contractual terms, including the period to maturity, and uses observable market-based inputs, including forward curves.

Level 3 inputs are unobservable inputs employed for measuring the fair value of assets or liabilities. The Company does not have any recurring financial assets or liabilities that are recorded in its consolidated balance sheets as of December 31, 2023 and 2022 that are classified as Level 3 inputs.

Assets and liabilities reported at fair value on a recurring basis

(\$ in millions)	December 31, 2023			December 31, 2022		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Assets:						
Other current assets:						
Marketable equity securities	\$9	\$—	\$—	\$9	\$—	\$—
Foreign currency forward contracts ^(a)	—	28	—	—	27	—
Cross currency swaps ^(b)	—	2	—	—	39	—
Investments:						
Marketable equity securities	\$74	\$—	\$—	\$61	\$—	\$—
Other assets:						
Cross currency swaps ^(b)	\$—	\$31	\$—	\$—	\$49	\$—
Liabilities:						
Accounts payable and accrued liabilities:						
Foreign currency forward contracts ^(a)	\$—	\$5	\$—	\$—	\$3	\$—
Interest rate swaps ^(c)	—	—	—	—	1	—
Other liabilities:						
Interest rate swaps ^(c)	\$—	\$14	\$—	\$—	\$19	\$—

(a) Derivatives not designated as hedging instruments

(b) Net investment hedges

(c) Fair value hedges

Long-Term Debt

(\$ in millions)	December 31, 2023 ^(a)	December 31, 2022 ^(b)
Long-term debt - carrying value	\$6,042	\$6,796
Long-term debt - fair value	\$5,781	\$6,375

(a) Excluding finance lease obligations of \$8 million and short term borrowings of \$4 million as of December 31, 2023.

(b) Excluding finance lease obligations of \$10 million and short term borrowings of \$10 million as of December 31, 2022.

The fair values of the debt instruments were measured using Level 2 inputs, including discounted cash flows and interest rates then currently available to the Company for instruments of the same remaining maturities.

12. Earnings Per Common Share

(\$ in millions, except per share amounts)	2023	2022	2021
Earnings per common share (attributable to PPG)			
Income from continuing operations, net of tax	\$1,270	\$1,028	\$1,420
(Loss)/income from discontinued operations, net of tax	—	(2)	19
Net income (attributable to PPG)	\$1,270	\$1,026	\$1,439
Weighted average common shares outstanding	236.0	236.1	237.6
Effect of dilutive securities:			
Stock options	0.5	0.5	1.0
Other stock compensation plans	0.7	0.7	0.8
Potentially dilutive common shares	1.2	1.2	1.8
Adjusted weighted average common shares outstanding	237.2	237.3	239.4
Earnings per common share (attributable to PPG)			
Income from continuing operations, net of tax	\$5.38	\$4.35	\$5.98
(Loss)/income from discontinued operations, net of tax	—	(0.01)	0.08
Net income (attributable to PPG)	\$5.38	\$4.34	\$6.06
Earnings per common share - assuming dilution (attributable to PPG)			
Income from continuing operations, net of tax	\$5.35	\$4.33	\$5.93
(Loss)/income from discontinued operations, net of tax	—	(0.01)	0.08
Net income (attributable to PPG)	\$5.35	\$4.32	\$6.01
Antidilutive securities ^(a) :			
Stock options	0.9	0.9	—

(a) Excluded from the computation of earnings per diluted share due to their antidilutive effect.

13. Income Taxes

The provision for income taxes by taxing jurisdiction and by significant components consisted of the following:

(\$ in millions)	2023	2022	2021
Current			
U.S. federal	\$102	\$137	\$25
U.S. state and local	16	20	13
Foreign	504	325	301
Total current income tax expense	\$622	\$482	\$339
Deferred			
U.S. federal	(\$153)	(\$79)	\$12
U.S. state and local	(14)	(7)	3
Foreign	(16)	(71)	20
Total deferred income tax (benefit)/expense	(\$183)	(\$157)	\$35
Total income tax expense	\$439	\$325	\$374

A reconciliation of the statutory U.S. corporate federal income tax rate to the Company's effective tax rate follows:

	2023	2022	2021
U.S. federal income tax rate	21.0%	21.0%	21.0%
Changes in rate due to:			
Taxes on non-U.S. earnings	4.2	3.6	2.7
Change in valuation allowance reserves	3.4	0.6	—
Other foreign tax effects	(2.7)	(1.6)	(0.4)
Impairment and other related charges, net	1.9	1.4	—
Uncertain tax positions	(1.7)	(0.4)	(1.4)
U.S. tax benefit on foreign operations	(0.9)	(0.4)	(1.6)
U.S. tax incentives	(0.8)	(1.0)	(0.6)
Tax benefits from equity awards	(0.2)	(0.3)	(0.3)
U.S. state and local taxes	—	0.7	0.8
Other	0.9	(0.1)	0.4
Effective income tax rate	25.1%	23.5%	20.6%

(Loss)/income before income taxes of the Company's U.S. operations for 2023, 2022 and 2021 was \$(75) million, \$288 million and \$469 million, respectively. Income before income taxes of the Company's foreign operations for 2023, 2022 and 2021 was \$1,823 million, \$1,093 million and \$1,346 million, respectively.

Deferred income taxes

Deferred income taxes are provided for the effect of temporary differences that arise because there are certain items treated differently for financial accounting than for income tax reporting purposes. The deferred tax assets and liabilities are determined by applying the enacted tax rate in the year in which the temporary difference is expected to reverse.

(\$ in millions)	2023	2022
Deferred income tax assets related to		
Employee benefits	\$273	\$275
Contingent and accrued liabilities	61	67
Operating loss and other carry-forwards	279	218
Operating lease liabilities	203	203
Research and development amortization	214	149
Other	201	168
Valuation allowance	(249)	(182)
Total	\$982	\$898
Deferred income tax liabilities related to		
Property	\$223	\$223
Intangibles	696	720
Employee benefits	47	81
Operating lease right-of-use assets	207	206
Other	44	74
Total	\$1,217	\$1,304
Deferred income tax liabilities – net	(\$235)	(\$406)

Net operating loss and credit carryforwards

(\$ in millions)	2023	2022	Expiration
<i>Available net operating loss carryforwards, tax effected:</i>			
Indefinite expiration	\$86	\$84	NA
Definite expiration	72	66	2024-2043
<i>Total</i>	<i>\$158</i>	<i>\$150</i>	
<i>Income tax credit carryforwards</i>	<i>\$108</i>	<i>\$89</i>	<i>2024-2043</i>

A valuation allowance of \$249 million and \$182 million has been established as of December 31, 2023 and 2022, respectively, for carryforwards and certain other items when the ability to utilize them is not likely.

Undistributed foreign earnings

The Company had \$5.8 billion of undistributed earnings of non-U.S. subsidiaries as of December 31, 2023. This amount relates to approximately 265 subsidiaries in approximately 70 taxable jurisdictions. The Company estimates repatriation of undistributed earnings of non-U.S. subsidiaries as of December 31, 2023 would result in a tax cost of \$123 million.

As of December 31, 2023, the Company had not changed its intention to reinvest foreign earnings indefinitely or repatriate when it is tax effective to do so, and as such, has not established a liability for foreign withholding taxes or other costs that would be incurred if the earnings were repatriated.

Unrecognized tax benefits

The Company files federal, state and local income tax returns in numerous domestic and foreign jurisdictions. In most tax jurisdictions, returns are subject to examination by the relevant tax authorities for a number of years after the returns have been filed. The Company is no longer subject to examinations by tax authorities in any major tax jurisdiction for years before 2008. Additionally, the Company is no longer subject to examination by the Internal Revenue Service for U.S. federal income tax returns filed for years through 2018. The examinations of the Company's U.S. federal income tax returns for 2019 and 2020 are currently underway.

A reconciliation of the total amounts of unrecognized tax benefits (excluding interest and penalties) as of December 31 follows:

(\$ in millions)	2023	2022	2021
January 1	\$145	\$158	\$175
Current year tax positions - additions	16	19	12
Prior year tax positions - additions	33	2	10
Prior year tax positions - reductions	(14)	(2)	(2)
Statute of limitations expirations	(9)	(23)	(19)
Settlements	(51)	(3)	(21)
Foreign currency translation	1	(6)	3
December 31	\$121	\$145	\$158

The Company expects that any reasonably possible change in the amount of unrecognized tax benefits in the next 12 months would not be significant. The total amount of unrecognized tax benefits that, if recognized, would affect the effective tax rate was \$117 million as of December 31, 2023.

Interest and penalties

(\$ in millions)	2023	2022	2021
Accrued interest and penalties related to unrecognized tax benefits	\$14	\$17	\$17
(Income)/loss recognized in income tax expense related to interest and penalties	(\$2)	\$1	(\$2)

The Company recognizes accrued interest and penalties related to unrecognized tax benefits in income tax expense.

14. Employee Benefit Plans

Defined Benefit Plans

PPG has defined benefit pension plans that cover certain employees worldwide. The principal defined benefit pension plans are those in the U.S., Canada, Germany, the Netherlands and the U.K. These plans in the aggregate represent approximately 93% of PPG's total projected benefit obligation at December 31, 2023, of which the U.S. defined benefit pension plans represent the largest component.

As of January 1, 2006, the Company's U.S. salaried defined benefit plans were closed to new entrants. In 2011 and 2012, the Company approved amendments related to its U.S. and Canadian defined benefit plans pursuant to which employees

stopped accruing benefits at certain dates based on the affected employee's combined age and years of service to PPG. As of December 31, 2020, the Company's U.S. and Canadian defined benefit plans were frozen for all participants. The Company plans to continue reviewing and potentially amending PPG defined benefit plans in the future.

U.S. pension annuity contracts

In March 2023, the Company purchased group annuity contracts that transferred to third-party insurance companies pension benefit obligations for certain of the Company's retirees in the U.S. who were receiving their monthly retirement benefit payments from a U.S. pension plan. The amount of each affected retiree's annuity payment is equal to the amount of such individual's pension benefit. The purchase of group annuity contracts was funded directly by the assets of the U.S. plans. By transferring the obligations and assets to the insurance companies, the Company reduced its overall pension projected benefit obligation by \$309 million and recognized a non-cash Pension settlement charge of \$190 million in the consolidated statement of income for the year ended December 31, 2023.

Canadian pension annuity contracts

In December 2021, the Company purchased group annuity contracts that transferred pension benefit obligations for certain of the Company's retirees in Canada who were receiving their monthly retirement benefit payments from PPG's Canadian pension plans to a third-party insurance company. The amount of each affected retiree's annuity payment is equal to the amount of such individual's pension benefit. The purchase of group annuity contracts was funded directly by the assets of the Canadian plans. By transferring the obligations and assets to the insurance company, the Company reduced its overall pension projected benefit obligation by approximately \$175 million and recognized a non-cash pension settlement charge of \$50 million in the consolidated statement of income for the year ended December 31, 2021.

Postretirement medical

PPG sponsors welfare benefit plans that provide postretirement medical and life insurance benefits for certain U.S. and Canadian employees and their dependents of which the U.S. welfare benefit plans represent approximately 86% of PPG's total projected benefit obligation at December 31, 2023. Salaried and certain hourly employees in the U.S. hired on or after October 1, 2004, or rehired on or after October 1, 2012 are not eligible for postretirement medical benefits. These plans in the U.S. and Canada require retiree contributions based on retiree-selected coverage levels for certain retirees and their dependents and provide for sharing of future benefit cost increases between PPG and participants based on management discretion. The Company has the right to modify, amend or terminate certain of these benefit plans in the future.

Effective January 1, 2017, the Company-sponsored Medicare-eligible plans were replaced by a Medicare private exchange. The announcement of this plan design change triggered a remeasurement of PPG's retiree medical benefit obligation using prevailing interest rates. The plan design change resulted in a \$306 million reduction in the Company's postretirement benefit obligation. PPG accounted for the plan design change prospectively, and the impact was amortized to periodic postretirement benefit cost over a 5.6 year period through mid-2022.

The following table sets forth the changes in projected benefit obligations (“PBO”), plan assets, the funded status and the amounts recognized on the accompanying consolidated balance sheet for the Company’s defined benefit pension and other postretirement benefit plans:

Defined Benefit Pension Plans						
	United States		International		Total PPG	
<i>(\$ in millions)</i>	2023	2022	2023	2022	2023	2022
Projected benefit obligation, January 1	\$1,425	\$1,920	\$961	\$1,614	\$2,386	\$3,534
Service cost	—	—	7	9	7	9
Interest cost	62	45	49	28	111	73
Actuarial losses/(gains)	44	(449)	75	(485)	119	(934)
Benefits paid	(79)	(91)	(50)	(49)	(129)	(140)
Foreign currency translation adjustments	—	—	47	(126)	47	(126)
Settlements	(309)	—	(11)	(22)	(320)	(22)
Other	—	—	(5)	(8)	(5)	(8)
Projected benefit obligation, December 31	\$1,143	\$1,425	\$1,073	\$961	\$2,216	\$2,386
Market value of plan assets, January 1	\$1,028	\$1,329	\$946	\$1,646	\$1,974	\$2,975
Actual return on plan assets	45	(228)	43	(506)	88	(734)
Company contributions	28	—	18	11	46	11
Benefits paid	(61)	(73)	(40)	(41)	(101)	(114)
Plan settlements	(309)	—	(11)	(22)	(320)	(22)
Foreign currency translation adjustments	—	—	45	(140)	45	(140)
Other	—	—	(3)	(2)	(3)	(2)
Market value of plan assets, December 31	\$731	\$1,028	\$998	\$946	\$1,729	\$1,974
Funded Status	(\$412)	(\$397)	(\$75)	(\$15)	(\$487)	(\$412)
Amounts recognized in the Consolidated Balance Sheet:						
Other assets (long-term)	—	—	152	183	152	183
Accounts payable and accrued liabilities	(38)	(17)	(13)	(12)	(51)	(29)
Accrued pensions	(374)	(380)	(214)	(186)	(588)	(566)
Net liability recognized	(\$412)	(\$397)	(\$75)	(\$15)	(\$487)	(\$412)
Other Postretirement Benefit Plans						
	United States		International		Total PPG	
<i>(\$ in millions)</i>	2023	2022	2023	2022	2023	2022
Projected benefit obligation, January 1	\$458	\$631	\$66	\$93	\$524	\$724
Service cost	4	8	—	—	4	8
Interest cost	23	13	4	3	27	16
Plan amendments	(17)	—	—	—	(17)	—
Actuarial (gains)/losses	(3)	(154)	3	(20)	—	(174)
Benefits paid	(39)	(40)	(3)	(4)	(42)	(44)
Foreign currency translation adjustments	—	—	1	(6)	1	(6)
Curtailments	(2)	—	—	—	(2)	—
Projected benefit obligation, December 31	\$424	\$458	\$71	\$66	\$495	\$524
Amounts recognized in the Consolidated Balance Sheet:						
Accounts payable and accrued liabilities	(41)	(44)	(4)	(4)	(45)	(48)
Other postretirement benefits	(383)	(414)	(67)	(62)	(450)	(476)
Net liability recognized	(\$424)	(\$458)	(\$71)	(\$66)	(\$495)	(\$524)

The PBO is the actuarial present value of benefits attributable to employee service rendered to date, including the effects of estimated future pay increases. The accumulated benefit obligation (“ABO”) is the actuarial present value of benefits attributable to employee service rendered to date, but does not include the effects of estimated future pay increases. The ABO for all defined benefit pension plans as of December 31, 2023 and 2022 was \$2.2 billion and \$2.3 billion, respectively.

The following table details the pension plans where the benefit liability exceeds the fair value of the plan assets:

(\$ in millions)	Pensions	
	2023	2022
Plans with PBO in Excess of Plan Assets:		
Projected benefit obligation	\$1,426	\$1,863
Fair value of plan assets	\$771	\$1,270
Plans with ABO in Excess of Plan Assets:		
Accumulated benefit obligation	\$1,366	\$1,833
Fair value of plan assets	\$737	\$1,266

Net actuarial losses/(gains) and prior service credit deferred in accumulated other comprehensive loss

(\$ in millions)	Pensions		Other Postretirement Benefits	
	2023	2022	2023	2022
Accumulated net actuarial losses/(gains)	\$682	\$748	(\$15)	(\$16)
Accumulated prior service credit	—	—	(20)	(10)
Total	\$682	\$748	(\$35)	(\$26)

The accumulated net actuarial losses (gains) for pensions and other postretirement benefits relate primarily to historical changes in the discount rates. The accumulated net actuarial losses exceeded 10% of the higher of the market value of plan assets or the PBO at the beginning of each of the last three years; therefore, amortization of such excess has been included in net periodic benefit costs for pension and other postretirement benefits in these periods. The amortization period is the average remaining service period of active employees expected to receive benefits unless a plan is mostly inactive in which case the amortization period is the average remaining life expectancy of the plan participants. Accumulated prior service credit is amortized over the future service periods of those employees who are active at the dates of the plan amendments and who are expected to receive benefits.

The net decrease in Accumulated other comprehensive loss (pretax) related to defined benefit pension and other postretirement benefit plans during the year ended December 31, 2023 was due to the following:

(\$ in millions)	Pensions	Other Postretirement Benefits
Net actuarial loss arising during the year	\$141	\$—
Plan amendment	—	(17)
Amortization of actuarial loss/(gain)	(21)	1
Amortization of prior service credit	—	7
Foreign currency translation adjustments	8	—
Impact of settlements	(194)	—
Net decrease	(\$66)	(\$9)

The 2023 net actuarial loss related to the Company's pension and other postretirement benefit plans was primarily due to a decrease in the weighted average discount rate used to determine the benefit obligation at December 31, 2023. The Company also recognized a net actuarial gain of \$17 million in 2023 due to a plan amendment to its U.S. other postretirement benefits plan, whereby effective January 1, 2024, PPG eliminated retiree life insurance benefits for certain salaried active participants who are not eligible for retiree medical benefits.

Net periodic benefit cost/(income)

(\$ in millions)	Pensions			Other Postretirement Benefits		
	2023	2022	2021	2023	2022	2021
Service cost	\$7	\$9	\$9	\$4	\$8	\$12
Interest cost	111	73	65	27	16	14
Expected return on plan assets	(110)	(140)	(152)	—	—	—
Amortization of prior service credit	—	—	—	(7)	(11)	(54)
Amortization of actuarial losses/(gains)	21	34	39	(1)	12	20
Settlements, curtailments, and special termination benefits	192	6	53	(2)	—	—
Net periodic benefit cost/(income)	\$221	(\$18)	\$14	\$21	\$25	(\$8)

Service cost for net periodic pension and other postretirement benefit costs is included in Cost of sales, exclusive of depreciation and amortization, Selling, general and administrative, and Research and development, net in the accompanying consolidated statement of income. Except for the U.S. pension settlement charge in 2023 and the Canadian pension settlement charge in 2021, which are both recorded in Pension settlement charge, all other non-service cost components of net periodic benefit cost are recorded in Other charges/(income), net in the accompanying consolidated statement of income.

Key assumptions

The following weighted average assumptions were used to determine the benefit obligation for the Company's defined benefit pension and other postretirement plans as of December 31, 2023 and 2022:

	United States		International		Total PPG	
	2023	2022	2023	2022	2023	2022
Discount rate	5.2%	5.4%	4.5%	4.9%	4.9%	5.2%
Rate of compensation increase	2.5%	2.5%	3.2%	3.1%	2.8%	2.7%

The following weighted average assumptions were used to determine the net periodic benefit cost for the Company's defined benefit pension and other postretirement benefit plans for the three years in the period ended December 31, 2023:

	2023	2022	2021
Discount rate	5.2%	2.5%	2.1%
Expected return on assets	6.5%	5.0%	4.8%
Rate of compensation increase	2.7%	2.6%	1.5%

These assumptions for each plan are reviewed on an annual basis. In determining the expected return on plan asset assumption, the Company evaluates the mix of investments that comprise each plan's assets and external forecasts of future long-term investment returns. The Company compares the expected return on plan assets assumption to actual historic returns to ensure reasonability. For 2023, the return on plan assets assumption for PPG's U.S. defined benefit pension plans was 7.4%. A change in the rate of return of 75 basis points, with other assumptions held constant, would impact 2024 net periodic pension expense by \$5 million. The global expected return on plan assets assumption to be used in determining 2024 net periodic pension expense will be 6.6% (7.7% for the U.S. plans only).

The discount rates used in accounting for pension and other postretirement benefits are determined using a yield curve constructed of high-quality fixed-income securities as of the measurement date and using the plans' projected benefit payments. The Company has elected to use a full yield curve approach in the estimation of the service and interest cost components of net periodic pension benefit cost/(income) for countries with significant pension plans. The full yield curve approach (also known as the split-rate or spot-rate method) allows the Company to align the applicable discount rates with the cost of additional service being earned and the interest being accrued on these obligations. A change in the discount rate of 75 basis points, with all other assumptions held constant, would impact 2024 net periodic benefit expense for our defined benefit pension and other postretirement benefit plans by \$3 million and \$2 million, respectively.

The weighted-average health care cost trend rate (inflation) used for 2023 was 5.8% declining to a projected 3.9% in the year 2047. For 2024, the assumed weighted-average health care cost trend rate used will be 5.5% declining to a projected 3.9% between 2024 and 2048 for medical and prescription drug costs, respectively. These assumptions are reviewed on an annual basis. In selecting rates for current and long-term health care cost assumptions, the Company takes into consideration a number of factors, including the Company's actual health care cost increases, the design of the Company's benefit programs, the demographics of the Company's active and retiree populations and external expectations of future medical cost inflation rates.

Contributions to defined benefit pension plans

(\$ in millions)	2023	2022	2021
U.S. defined benefit pension plans	\$28	\$—	\$—
Non-U.S. defined benefit pension plans	\$18	\$11	\$10

PPG made voluntary contributions to its U.S. defined benefit pension plans of \$28 million during 2023. Contributions made to PPG's non-U.S. defined benefit pension plans in 2023, 2022, and 2021 were required by local funding requirements. In addition to any mandatory contributions, PPG may elect to make voluntary contributions to its defined benefit pension plans in 2024 and beyond.

Benefit payments

The estimated benefits expected to be paid under the Company's defined benefit pension and other postretirement benefit plans are:

(\$ in millions)	Pensions	Other Postretirement Benefits
2024	\$152	\$45
2025	\$137	\$44
2026	\$140	\$41
2027	\$145	\$40
2028	\$146	\$40
2029 to 2033	\$775	\$177

Plan assets

Each PPG sponsored defined benefit pension plan is managed in accordance with the requirements of local laws and regulations governing defined benefit pension plans for the exclusive purpose of providing pension benefits to participants and their beneficiaries. Investment committees comprised of PPG managers have fiduciary responsibility to oversee the management of pension plan assets by third party asset managers. Pension plan assets are held in trust by financial institutions and managed on a day-to-day basis by the asset managers. The asset managers receive a mandate from each investment committee that is aligned with the asset allocation targets established by each investment committee to achieve the plan's investment strategies. The performance of the asset managers is monitored and evaluated by the investment committees throughout the year.

Pension plan assets are invested to generate investment earnings over an extended time horizon to help fund the cost of benefits promised under the plans while mitigating investment risk. The asset allocation targets established for each pension plan are intended to diversify the investments among a variety of asset categories and among a variety of individual securities within each asset category to mitigate investment risk and provide each plan with sufficient liquidity to fund the payment of pension benefits to retirees.

The following summarizes the weighted average target pension plan asset allocation as of December 31, 2023 and 2022 for all PPG defined benefit plans:

Asset Category	2023	2022
Equity securities	15-45%	15-45%
Debt securities	30-65%	30-65%
Real estate	0-10%	0-10%
Other	20-40%	20-40%

The fair values of the Company's pension plan assets at December 31, 2023 and 2022, by asset category, are as follows:

(\$ in millions)	December 31, 2023				December 31, 2022			
	Level 1 ⁽¹⁾	Level 2 ⁽¹⁾	Level 3 ⁽¹⁾	Total	Level 1 ⁽¹⁾	Level 2 ⁽¹⁾	Level 3 ⁽¹⁾	Total
Asset Category								
Equity securities:								
U.S.								
Large cap	\$65	\$55	\$—	\$120	\$66	\$43	\$—	\$109
Small cap	16	—	—	16	25	—	—	25
Non-U.S.								
Developed and emerging markets ⁽²⁾	96	43	—	139	99	43	—	142
Debt securities:								
Cash and cash equivalents								
Cash and cash equivalents	22	41	—	63	7	47	—	54
Corporate ⁽³⁾								
U.S. ⁽⁴⁾								
U.S. ⁽⁴⁾	—	1	—	1	—	168	80	248
Developed and emerging markets ⁽²⁾	—	—	—	—	—	1	—	1
Diversified ⁽⁵⁾	—	—	—	—	—	13	—	13
Government								
U.S. ⁽⁴⁾								
U.S. ⁽⁴⁾	—	—	—	—	49	10	—	59
Developed and emerging markets ⁽²⁾	—	1	—	1	—	6	—	6
Other ⁽⁶⁾	—	—	258	258	—	—	235	235
Real estate, hedge funds, and other	—	306	341	647	—	275	362	637
Total assets in the fair value hierarchy	\$199	\$447	\$599	\$1,245	\$246	\$606	\$677	\$1,529
Common-collective trusts ⁽⁷⁾								
Common-collective trusts ⁽⁷⁾	—	—	—	484	—	—	—	445
Total Investments	\$199	\$447	\$599	\$1,729	\$246	\$606	\$677	\$1,974

(1) These levels refer to the accounting guidance on fair value measurement described in Note 11, "Financial Instruments, Hedging Activities and Fair Value Measurements."

(2) This category represents holdings in investment grade debt or equity securities of issuers in both developed markets and emerging economies.

(3) This category represents investment grade debt securities from a diverse set of industry issuers.

(4) This category primarily represents long duration fixed income securities.

(5) This category represents commingled funds invested in diverse portfolios of debt securities.

(6) This category primarily represents insurance contracts.

(7) Certain investments that are measured at net asset value per share (or its equivalent) are not required to be classified in the fair value hierarchy.

The change in the fair value of the Company's Level 3 pension assets for the years ended December 31, 2023 and 2022 was as follows:

(\$ in millions)	Real Estate	Other Debt Securities	Hedge Funds and Other Assets	Total
January 1, 2022	\$157	\$367	\$430	\$954
Realized gains/(losses)	1	(99)	(1)	(99)
Unrealized gains	6	—	(3)	3
Transfers in/(out), net	(10)	(12)	(100)	(122)
Foreign currency losses	(5)	(21)	(33)	(59)
December 31, 2022	\$149	\$235	\$293	\$677
Realized gains/(losses)	4	25	(29)	—
Unrealized gains/(losses)	(19)	—	21	2
Transfers out, net	(17)	(9)	(89)	(115)
Foreign currency losses	2	7	26	35
December 31, 2023	\$119	\$258	\$222	\$599

Real estate properties are externally appraised at least annually by reputable, independent appraisal firms. Property valuations are also reviewed on a regular basis and are adjusted if there has been a significant change in circumstances related to the property since the last valuation.

Other debt securities primarily consist of insurance contracts, which are valued externally by insurance companies based on the present value of the expected future cash flows.

Hedge funds consist of a wide range of investments which target a relatively stable investment return. The underlying funds are valued at different frequencies, some monthly and some quarterly, based on the value of the underlying investments. Other assets consist primarily of small investments in private equity funds and debt obligations of non-investment grade borrowers.

Other Plans

Employee savings plans

PPG's Employee Savings Plans ("Savings Plans") cover substantially all employees in the U.S., Puerto Rico and Canada. The Company makes matching contributions to the Savings Plans, at management's discretion, based upon participants' savings, subject to certain limitations. For most participants, Company-matching contributions are established each year at the discretion of the Company and are applied to participant accounts up to a maximum of 6% of eligible participant compensation. The Company-matching contribution remained at 100% for 2023.

Compensation expense and cash contributions related to the Company match of participant contributions to the Savings Plans for 2023, 2022, and 2021 totaled \$61 million, \$56 million and \$52 million, respectively. A portion of the Savings Plans qualifies under the Internal Revenue Code as an Employee Stock Ownership Plan. Accordingly, dividends received on PPG shares held in that portion of the Savings Plans totaling \$11 million, \$11 million, and \$10 million for 2023, 2022, and 2021, respectively, are deductible for PPG's U.S. Federal tax purposes.

Defined contribution plans

Additionally, the Company has defined contribution plans for certain employees in the U.S., China, United Kingdom, Australia, Italy and other countries. The U.S. defined contribution plan is part of the Employee Savings Plan, and eligible employees receive a contribution equal to between 2% and 5% of annual compensation, based on age and years of service. For the years ended December 31, 2023, 2022 and 2021, the Company recognized expense for its defined contribution retirement plans of \$90 million, \$92 million and \$88 million, respectively. The Company's annual cash contributions to its defined contribution retirement plans approximated the expense recognized in each year.

Deferred compensation plan

The Company has a deferred compensation plan for certain key managers which allows them to defer a portion of their compensation in a phantom PPG stock account or other phantom investment accounts. The amount deferred earns a return based on the investment options selected by the participant. The amount owed to participants is an unfunded and unsecured general obligation of the Company. Upon retirement, death, disability, termination of employment, scheduled payment or unforeseen emergency, the compensation deferred and related accumulated earnings are distributed in accordance with the participant's election in cash or in PPG stock, based on the accounts selected by the participant.

The plan provides participants with investment alternatives and the ability to transfer amounts between the phantom non-PPG stock investment accounts. To mitigate the impact on compensation expense of changes in the market value of the liability, the Company has purchased a portfolio of marketable securities that mirror the phantom non-PPG stock investment accounts selected by the participants, except the money market accounts. These investments are carried by PPG at fair market value, and the changes in market value of these securities are also included in Income before income taxes in the consolidated statement of income. Trading occurs in this portfolio to align the securities held with the participant's phantom non-PPG stock investment accounts, except the money market accounts.

The cost of the deferred compensation plan, comprised of dividend equivalents accrued on the phantom PPG stock account, investment income and the change in market value of the liability, was \$23 million, \$23 million and \$20 million in 2023, 2022 and 2021, respectively. These amounts are included in Selling, general and administrative in the consolidated statements of income. The change in market value of the investment portfolio was income of \$21 million, \$24 million, and \$18 million in 2023, 2022 and 2021, respectively, and is also included in Selling, general and administrative in the consolidated statements of income.

The Company's obligations under this plan, which are included in Accounts payable and accrued liabilities and Other liabilities on the consolidated balance sheet, totaled \$113 million and \$105 million as of December 31, 2023 and 2022, respectively, and the investments in marketable securities, which are included in Investments and Other current assets on the accompanying consolidated balance sheet, were \$83 million and \$70 million as of December 31, 2023 and 2022, respectively.

15. Commitments and Contingent Liabilities

PPG is involved in a number of lawsuits and claims, both actual and potential, including some that it has asserted against others, in which substantial monetary damages are sought. These lawsuits and claims may relate to contract, patent, environmental, product liability, antitrust, employment and other matters arising out of the conduct of PPG's current and past business activities. To the extent that these lawsuits and claims involve personal injury, property damage and certain other claims, PPG believes it has adequate insurance; however, certain of PPG's insurers are contesting coverage with

respect to some of these claims, and other insurers may contest coverage with respect to some claims in the future. PPG's lawsuits and claims against others include claims against insurers and other third parties with respect to actual and contingent losses related to environmental, asbestos and other matters.

The results of any current or future litigation and claims are inherently unpredictable. However, management believes that, in the aggregate, the outcome of all lawsuits and claims involving PPG will not have a material effect on PPG's consolidated financial position or liquidity; however, such outcome may be material to the results of operations of any particular period in which costs, if any, are recognized.

Asbestos Matters

As of December 31, 2023, the Company was aware of certain asbestos-related claims pending against the Company and certain of its subsidiaries. The Company is defending these asbestos-related claims vigorously. The asbestos-related claims consist of claims against the Company alleging:

- exposure to asbestos or asbestos-containing products manufactured, sold or distributed by the Company or its subsidiaries ("Products Claims");
- personal injury caused by asbestos on premises presently or formerly owned, leased or occupied by the Company ("Premises Claims"); and
- asbestos-related claims against a subsidiary the Company acquired in 2013 ("Subsidiary Claims").

The Company monitors and reviews the activity associated with its asbestos claims and evaluates, on a periodic basis, its estimated liability for such claims and all underlying assumptions to determine whether any adjustment to the reserves for these claims is required. Additionally, as a supplement to its periodic monitoring and review, the Company conducts discussions with counsel and engages valuation consultants to analyze its claims history and estimate the amount of the Company's potential liability for asbestos-related claims.

In 2023 and 2022, no adjustments to the Company's estimate of its asbestos-related liabilities were required.

In 2021, based on the results of the Company's valuation analysis, the Company reduced its estimate of potential liability for Products Claims by \$146 million. The 2021 valuation analysis with respect to Products Claims was based, in part, upon a review of claims data following the expiration in May 2016 of the U.S. Bankruptcy Court's injunction staying most asbestos claims against the Company that had been in effect since April 2000; annual filings by disease and year; pending, paid and dismissed claims; indemnity cash flows; and estimates of future claim, indemnity and acceptance rates. The Company also adjusted its estimates of potential liability for Premises Claims and Subsidiary Claims in the fourth quarter of 2021.

As a result of the Company's 2021 review of its asbestos-related liabilities, income of \$133 million was recorded in the consolidated statement of income to reduce the reserve to reflect the Company's current estimate of potential liability for asbestos-related bodily injury claims through December 31, 2021.

As of December 31, 2023 and 2022, the Company's asbestos-related reserves totaled \$48 million and \$51 million, respectively.

The Company believes that, based on presently available information, the total reserves of \$48 million for asbestos-related claims will be sufficient to encompass all of the Company's current and estimable potential future asbestos liabilities. These reserves, which are included within Other liabilities on the accompanying consolidated balance sheets, involve significant management judgment and represent the Company's current best estimate of its liability for these claims.

The amount reserved for asbestos-related claims by its nature is subject to many uncertainties that may change over time, including (i) the ultimate number of claims filed; (ii) whether closed, dismissed or dormant claims are reinstated, reinstated or revived; (iii) the amounts required to resolve both currently known and future unknown claims; (iv) the amount of insurance, if any, available to cover such claims; (v) the unpredictable aspects of the tort system, including a changing trial docket and the jurisdictions in which trials are scheduled; (vi) the outcome of any trials, including potential judgments or jury verdicts; (vii) the lack of specific information in many cases concerning exposure for which the Company is allegedly responsible, and the claimants' alleged diseases resulting from such exposure; and (viii) potential changes in applicable federal and/or state tort liability law. All of these factors may have a material effect upon future asbestos-related liability estimates. While the ultimate outcome of the Company's asbestos litigation cannot be predicted with certainty, the Company believes that any financial exposure resulting from its asbestos-related claims will not have a material adverse effect on the Company's consolidated financial position, liquidity or results of operations.

Environmental Matters

In management's opinion, the Company operates in an environmentally sound manner and the outcome of the Company's environmental contingencies will not have a material effect on PPG's financial position or liquidity; however, any such

outcome may be material to the results of operations of any particular period in which costs, if any, are recognized. Management anticipates that the resolution of the Company's environmental contingencies will occur over an extended period of time.

As remediation at certain environmental sites progresses, PPG continues to refine its assumptions underlying the estimates of the expected future costs of its remediation programs. PPG's ongoing evaluation may result in additional charges against income to adjust the reserves for these sites. In 2023, 2022 and 2021, certain charges have been recorded based on updated estimates to increase existing reserves for these sites. Certain other charges related to environmental remediation actions are recorded to expense as incurred.

As of December 31, 2023 and 2022, PPG had reserves for environmental contingencies associated with PPG's former chromium manufacturing plant in Jersey City, New Jersey ("New Jersey Chrome"), glass and chemical manufacturing sites, and for other environmental contingencies, including current manufacturing locations and National Priority List sites. These reserves are reported as Accounts payable and accrued liabilities and Other liabilities in the accompanying consolidated balance sheet.

Environmental Reserves		
<i>(\$ in millions)</i>	2023	2022
New Jersey Chrome	\$53	\$58
Glass and chemical	54	60
Other	120	99
Total environmental reserves	\$227	\$217
<i>Current Portion</i>	\$52	\$50

Pretax charges against income for environmental remediation costs are included in Other charges/(income), net in the accompanying consolidated statement of income. The pretax charges and cash outlays related to such environmental remediation in 2023, 2022 and 2021, were as follows:

<i>(\$ in millions)</i>	2023	2022	2021
New Jersey Chrome	\$7	\$—	\$25
Glass and chemical	5	3	12
Other	34	10	7
Total pretax environmental charges	\$46	\$13	\$44
<i>Cash outlays for environmental spending</i>	\$36	\$78	\$56

In the fourth quarter 2023, the Company recognized pretax environmental charges of \$30 million related to certain legacy PPG manufacturing sites, primarily due to an increase in estimated environmental remediation costs at the Riverside Industrial Park Superfund Site in Newark, New Jersey ("Riverside") and the New Jersey Chrome sites. The Company entered into a consent decree with the United States Department of Justice and the United States Environmental Protection Agency related to the Riverside site during the fourth quarter 2023, which resulted in an increase in estimated environmental remediation costs for soil cleanup and certain other costs.

In the fourth quarter 2021, PPG released an environmental reserve previously established at the time of the sale of the flat glass business under the terms of the separation agreement, resulting in recognition of \$25 million of income from discontinued operations, or \$19 million net of tax.

The Company continues to analyze, assess and remediate the environmental issues associated with New Jersey Chrome as further discussed below. Excluding the charges related to New Jersey Chrome, pretax charges against income for environmental remediation have ranged between approximately \$5 million and \$40 million per year for the past 10 years.

Management expects cash outlays for environmental remediation costs to range from \$40 million to \$60 million in 2024, and \$20 million to \$75 million annually from 2025 through 2028.

Actual future cash outlays may vary from expected future cash outlays and actual future costs may vary from accrued estimates due to the inherent uncertainties involved in estimating future environmental remediation costs, including possible technological, regulatory and enforcement developments, the results of environmental studies and other factors. Specifically, the level of expected future remediation costs and cash outlays is highly dependent upon activity related to New Jersey Chrome as discussed below.

Remediation: New Jersey Chrome

In June 2009, PPG entered into a settlement agreement with the New Jersey Department of Environmental Protection ("NJDEP") and Jersey City, New Jersey (which had asserted claims against PPG for lost tax revenue) which was in the form of a Partial Consent Judgement (the "Consent"). Under the Consent, PPG accepted sole responsibility for the remediation activities at its former chromium manufacturing location in Jersey City and a number of additional surrounding sites. Remediation of the New Jersey Chrome sites requires PPG to remediate soil and groundwater contaminated by

hexavalent chromium, as well as perform certain other environmental remediation activities. The most significant assumptions underlying the estimate of remediation costs for all New Jersey Chrome sites relate to the extent and concentration of chromium in the soil.

PPG regularly evaluates the assessments of costs incurred to date versus current progress and the potential cost impacts of the most recent information, including the extent of impacted soils and groundwater, engineering, administrative and other associated costs. Based on these assessments, the reserve is adjusted accordingly. As of December 31, 2023 and 2022, PPG's reserve for remediation of all New Jersey Chrome sites was \$53 million and \$58 million, respectively. The major cost components of this liability are related to excavation of impacted soil, as well as long-term monitoring. These components each account for approximately 65% and 10% of the amount accrued at December 31, 2023, respectively.

There are multiple, future events yet to occur, including further remedy selection and design, remedy implementation and execution and applicable governmental agency or community organization approvals. Considerable uncertainty exists regarding the timing of these future events for the New Jersey Chrome sites. Further resolution of these events is expected to occur over the next several years. As these events occur and to the extent that the cost estimates of the environmental remediation remedies change, the existing reserve for this environmental remediation matter will continue to be adjusted.

Remediation: Glass, Chemicals and Other Sites

Among other sites at which PPG is managing environmental liabilities, remedial actions are occurring at a chemical manufacturing site in Barberton, Ohio where PPG has completed a Facility Investigation and Corrective Measure Study under the United States Environmental Protection Agency's Resource Conservation and Recovery Act Corrective Action Program. PPG has also been addressing the impacts from a legacy plate glass manufacturing site in Kokomo, Indiana under the Voluntary Remediation Program of the Indiana Department of Environmental Management and a site associated with a legacy plate glass manufacturing site near Ford City, Pennsylvania under the Pennsylvania Land Recycling Program under the oversight of the Pennsylvania Department of Environmental Protection. PPG is currently performing additional investigation and remedial activities at these locations.

With respect to certain other waste sites, the financial condition of other potentially responsible parties also contributes to the uncertainty of estimating PPG's final costs. Although contributors of waste to sites involving other potentially responsible parties may face governmental agency assertions of joint and several liability, in general, final allocations of costs are made based on the relative contributions of wastes to such sites. PPG is generally not a major contributor to such sites.

Remediation: Reasonably Possible Matters

In addition to the amounts currently reserved for environmental remediation, the Company may be subject to loss contingencies related to environmental matters estimated to be as much as \$100 million to \$200 million. Such unreserved losses are reasonably possible but are not currently considered to be probable of occurrence. These reasonably possible unreserved losses relate to environmental matters at a number of sites, none of which are individually significant. The loss contingencies related to these sites include significant unresolved issues such as the nature and extent of contamination at these sites and the methods that may have to be employed to remediate them.

The impact of evolving programs, such as natural resource damage claims, industrial site re-use initiatives and domestic and international remediation programs, also adds to the present uncertainties with regard to the ultimate resolution of this unreserved exposure to future loss. The Company's assessment of the potential impact of these environmental contingencies is subject to considerable uncertainty due to the complex, ongoing and evolving process of investigation and remediation, if necessary, of such environmental contingencies, and the potential for technological and regulatory developments.

16. Shareholders' Equity

A class of 10 million shares of preferred stock, without par value, is authorized but unissued. Common stock has a par value of \$1.66 ²/₃ per share; 1.2 billion shares are authorized.

	Common Stock	Treasury Stock	Shares Outstanding
January 1, 2021	581,146,136	(344,459,871)	236,686,265
Purchases	—	(1,521,765)	(1,521,765)
Issuances	—	742,526	742,526
December 31, 2021	581,146,136	(345,239,110)	235,907,026
Purchases	—	(1,269,830)	(1,269,830)
Issuances	—	436,730	436,730
December 31, 2022	581,146,136	(346,072,210)	235,073,926
Purchases	—	(673,638)	(673,638)
Issuances	—	810,566	810,566
December 31, 2023	581,146,136	(345,935,282)	235,210,854

Per share cash dividends paid were \$2.54, \$2.42 and \$2.26 in 2023, 2022 and 2021, respectively.

17. Accumulated Other Comprehensive Loss (AOCL)

(\$ in millions)	Foreign Currency Translation Adjustments ⁽¹⁾	Pension and Other Postretirement Benefit Adjustments, net of tax ⁽²⁾	Unrealized Gain on Derivatives, net of tax	Accumulated Other Comprehensive Loss
January 1, 2021	(\$1,663)	(\$937)	\$1	(\$2,599)
Current year deferrals to AOCL	(325)	132	—	(193)
Reclassifications from AOCL to net income	—	42	—	42
December 31, 2021	(\$1,988)	(\$763)	\$1	(\$2,750)
Current year deferrals to AOCL	(301)	175	—	(126)
Reclassifications from AOCL to net income	35	31	—	66
December 31, 2022	(\$2,254)	(\$557)	\$1	(\$2,810)
Current year deferrals to AOCL	475	(93)	—	382
Reclassifications from AOCL to net income	33	156	—	189
December 31, 2023	(\$1,746)	(\$494)	\$1	(\$2,239)

- (1) The tax cost related to unrealized foreign currency translation adjustments on net investment hedges as of December 31, 2023, 2022 and 2021 was \$47 million, \$73 million and \$55 million, respectively.
- (2) The tax cost related to the adjustment for pension and other postretirement benefits as of December 31, 2023, 2022 and 2021 was \$20 million, \$83 million and \$48 million, respectively. Reclassifications from AOCL are included in the computation of net periodic benefit costs (see Note 14, "Employee Benefit Plans").

18. Other Charges/(Income), Net

(\$ in millions)	2023	2022	2021
Environmental charges ⁽¹⁾	\$46	\$13	\$44
Pension and other postretirement benefit plans, non-service cost components	39	(10)	(15)
Share of net earnings of equity affiliates (See Note 5)	(21)	(25)	(15)
Loss/(gain) on sale of assets, net ⁽²⁾	23	(4)	(44)
Argentina currency devaluation loss ⁽³⁾	20	—	—
Royalty income	(10)	(8)	(8)
Business restructuring (income)/charges, net	(2)	33	31
Income from legal settlements	—	—	(22)
Other, net	(12)	(26)	(83)
Total other charges/(income), net	\$83	(\$27)	(\$112)

- (1) In 2023, PPG recognized charges of \$30 million related to environmental remediation costs at certain legacy PPG manufacturing sites.
- (2) In 2023, PPG recognized a \$22 million loss on the divestitures of the European and Australian traffic solutions businesses. In 2021, PPG recognized a \$34 million gain on the sale of a production facility in connection with the Company's manufacturing footprint consolidation plans and associated restructuring programs.
- (3) In December 2023, the central bank of Argentina adjusted the official foreign currency exchange rate for the Argentine peso, significantly devaluing the currency relative to the United States dollar. Argentina currency devaluation losses represent foreign currency translation losses recognized during December 2023 related to the devaluation of the Argentine peso.

19. Stock-Based Compensation

The Company's stock-based compensation includes stock options, restricted stock units ("RSUs") and grants of contingent shares that are earned based on achieving targeted levels of total shareholder return. All current grants of stock options, RSUs and contingent shares are made under the PPG Industries, Inc. Amended and Restated Omnibus Incentive Plan ("PPG Amended Omnibus Plan"), which was amended and restated effective April 21, 2016.

(\$ in millions)	2023	2022	2021
Total stock-based compensation	\$59	\$35	\$57
Income tax benefit recognized	\$12	\$8	\$12

Stock Options

PPG has outstanding stock option awards that have been granted under the PPG Amended Omnibus Plan. Under the PPG Amended Omnibus Plan, certain employees of the Company have been granted options to purchase shares of common stock at prices equal to the fair market value of the shares on the date the options were granted. The options are generally exercisable 36 months after being granted and have a maximum term of 10 years. Upon exercise of a stock option, shares of Company stock are issued from treasury stock.

The fair value of stock options issued to employees is measured on the date of grant and is recognized as expense, net of estimated forfeitures, over the requisite service period. PPG estimates the fair value of stock options using the Black-Scholes option pricing model. The risk-free interest rate is determined by using the U.S. Treasury yield curve at the date of the grant and using a maturity equal to the expected life of the option. The expected life of options is calculated using the average of the vesting term and the maximum term, as prescribed by accounting guidance on the use of the simplified method for determining the expected term of an employee share option. The expected dividend yield and volatility are based on historical stock prices and dividend amounts over past time periods equal in length to the expected life of the options. PPG applies an estimated forfeiture rate that is calculated based on historical activity.

The following weighted average assumptions were used to calculate the fair values of stock option grants in each year:

	2023	2022	2021
Weighted average exercise price	\$130.17	\$151.87	\$136.60
Risk-free interest rate	3.9%	2.0%	1.0%
Expected life of option in years	6.5	6.5	6.5
Expected dividend yield	1.7%	1.6%	1.6%
Expected volatility	27.8%	25.7%	25.3%

The weighted average fair value of options granted was \$38.55 per share, \$36.52 per share and \$29.27 per share for the years ended December 31, 2023, 2022, and 2021, respectively.

Stock Options Outstanding and Exercisable	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in years)	Intrinsic Value (in millions)
Outstanding, January 1, 2023	3,517,451	\$117.16	5.7	
Granted	410,001	\$130.17		
Exercised	(566,439)	\$96.64		
Forfeited/Expired	(42,250)	\$138.64		
Outstanding, December 31, 2023	3,318,763	\$122.00	5.7	\$92
Vested or expected to vest, December 31, 2023	3,225,942	\$121.44	5.6	\$92
Exercisable, December 31, 2023	2,042,184	\$110.97	4.1	\$79

At December 31, 2023, unrecognized compensation cost related to outstanding stock options that have not yet vested totaled \$9 million. This cost is expected to be recognized as expense over a weighted average period of 1.7 years.

The following table presents stock option activity for the years ended December 31, 2023, 2022 and 2021:

(\$ in millions)	2023	2022	2021
Total intrinsic value of stock options exercised	\$24	\$12	\$32
Cash received from stock option exercises	\$55	\$12	\$47
Income tax benefit from the exercise of stock options	\$6	\$3	\$8
Total fair value of stock options vested	\$10	\$16	\$11

Restricted Stock Units ("RSUs")

Long-term incentive value is delivered to selected key management employees by granting RSUs, which have either time or performance-based vesting features. The fair value of an RSU is equal to the market value of a share of PPG common stock on the date of grant. Time-based RSUs generally vest over the three-year period following the date of grant, unless forfeited, and will be paid out in the form of stock, cash or a combination of both at the Company's discretion at the end of the three year vesting period. Performance-based RSUs vest based on achieving specific annual performance targets for earnings per share growth and cash flow return on capital over the three calendar year-end periods following the date of grant. Unless forfeited, the performance-based RSUs will be paid out in the form of stock at the end of the three-year performance period if PPG meets the performance targets.

The amount paid upon vesting of performance-based RSUs may range from 0% to 200% of the original grant, based upon the level of earnings per share growth achieved and frequency with which the annual cash flow return on capital performance target is met over the three calendar year periods comprising the vesting period. Performance against the earnings per share growth and the cash flow return on capital goal is calculated annually, and the annual payout for each goal will be weighted equally over the three-year period. The performance-based RSUs granted in 2021 vested at 133%. PPG has assumed that performance-based RSUs granted in 2022 and 2023 will both vest at the 100% level.

<i>RSU Activity</i>	<i>Number of Shares</i>	<i>Weighted Average Grant Date Fair Value</i>
Outstanding, January 1, 2023	589,388	\$136.99
Granted	321,045	\$130.63
Vested	(271,037)	\$131.14
Forfeited	(33,455)	\$136.26
Outstanding, December 31, 2023	605,941	\$137.96
Vested or expected to vest, December 31, 2023	569,073	\$137.94

There was \$22 million of total unrecognized compensation cost related to unvested RSUs outstanding as of December 31, 2023. This cost is expected to be recognized as expense over a weighted average period of 1.7 years.

Contingent Share Grants

The Company also provides grants of contingent shares to selected key executives that may be earned based on PPG's total shareholder return ("TSR") over the three-year period following the date of grant. Contingent share grants (referred to as "TSR awards") are made annually and are paid out at the end of each three-year period based on the Company's performance. Performance is measured by determining the percentile rank of the total shareholder return of PPG common stock in relation to the total shareholder return of the S&P 500 for the three-year period following the date of grant. This comparison group represents the entire S&P 500 Index as it existed at the beginning of the performance period, excluding any companies that have been removed from the index because they ceased to be publicly traded. The payout is based on performance achieved during the three-year period calculated in accordance with the scale set forth in the plan agreement and may range from 0% to 200% of the initial grant. A payout of 100% is earned if the target performance is achieved. Contingent share awards earn dividend equivalents for the award period, which will be paid to participants or credited to the participants' deferred compensation plan accounts with the award payout at the end of the period based on the actual number of contingent shares earned. Any payments made at the end of the award period may be in the form of stock, cash or a combination of both. The TSR awards are classified as liability awards, and compensation expense is recognized over the three-year award period based on the fair value of the awards (giving consideration to the Company's percentile rank of total shareholder return) remeasured in each reporting period until settlement of the awards.

The performance period for the TSR shares granted in 2021 ended on December 31, 2023, and PPG's total shareholder return was measured against that of the S&P 500 over the three-year period. PPG's ranking on this performance measure was at the 32nd percentile, resulting in payouts at 55.2% of target.

As of December 31, 2023, there was \$9 million of total unrecognized compensation cost related to outstanding TSR awards based on the current estimate of fair value. This cost is expected to be recognized as expense over a weighted average period of 1.8 years.

20. Revenue Recognition

The Company recognizes revenue when control of the promised goods or services is transferred to the customer and in amounts that the Company expects to collect. The timing of revenue recognition takes into consideration the various shipping terms applicable to the Company's sales. For most transactions, control passes in accordance with agreed upon delivery terms.

The Company delivers products to company-owned stores, home centers and other regional or national consumer retail outlets, paint dealers, concessionaires and independent distributors, company-owned distribution networks, and directly to manufacturing companies and retail customers. Each product delivered to a third party customer is considered to satisfy a performance obligation. Performance obligations generally occur at a point in time and are satisfied when control of the goods passes to the customer. The Company is entitled to collection of the sales price under normal credit terms in the regions in which it operates. Accounts receivable are recognized when there is an unconditional right to consideration. Payment terms vary from customer to customer, depending on creditworthiness, prior payment history and other considerations.

The Company also provides services by applying coatings to customers' manufactured parts and assembled products and by providing technical support to certain customers. Performance obligations are satisfied over time as critical milestones are met and as services are provided. PPG is entitled to payment as the services are rendered. For the years ended December 31, 2023, 2022 and 2021, service revenue constituted less than 5% of total revenue.

Net sales by segment and region for the years ended December 31, 2023, 2022 and 2021 were as follows:

(\$ in millions)	2023	2022	2021
Performance Coatings			
United States and Canada	\$4,912	\$4,718	\$4,366
EMEA	3,627	3,550	3,582
Asia Pacific	1,104	1,118	1,254
Latin America	1,521	1,308	1,131
Total	\$11,164	\$10,694	\$10,333
Industrial Coatings			
United States and Canada	\$2,576	\$2,666	\$2,310
EMEA	1,989	1,908	1,854
Asia Pacific	1,770	1,705	1,723
Latin America	747	679	582
Total	\$7,082	\$6,958	\$6,469
Total Net Sales⁽¹⁾			
United States and Canada ⁽²⁾	\$7,488	\$7,384	\$6,676
EMEA	5,616	5,458	5,436
Asia Pacific	2,874	2,823	2,977
Latin America	2,268	1,987	1,713
Total PPG	\$18,246	\$17,652	\$16,802

(1) Net sales to external customers are attributed to geographic regions based upon the location of the operating unit shipping the product.

(2) Net sales recognized in the United States represented 37%, 38%, and 36% of the Company's total Net sales for the years ended December 31, 2023, 2022 and 2021, respectively.

Allowance for Doubtful Accounts

All trade receivables are reported on the consolidated balance sheet at the outstanding principal amount adjusted for any allowance for doubtful accounts and any charge-offs. PPG provides an allowance for doubtful accounts to reduce trade receivables to their estimated net realizable value equal to the amount that is expected to be collected. This allowance is estimated based on historical collection experience, current regional economic and market conditions, the aging of accounts receivable, assessments of current creditworthiness of customers and forward-looking information. The use of forward-looking information is based on certain macroeconomic and microeconomic indicators including, but not limited to, regional business environment risk, political risk, and commercial and financing risks.

PPG reviews its allowance for doubtful accounts on a quarterly basis to ensure the estimate reflects regional risk trends as well as current and future global operating conditions.

The following table summarizes allowance for doubtful accounts activity for the years ended December 31, 2023 and 2022:

	Trade Receivables Allowance for Doubtful Accounts	
(\$ in millions)	2023	2022
January 1	\$31	\$31
Bad debt expense	17	52
Write-offs and recoveries of previously reserved trade receivables	(21)	(55)
Other	(2)	3
December 31	\$25	\$31

In the first quarter 2022, PPG recorded a bad debt reserve of \$43 million associated with the adverse economic impacts of the Russian invasion of Ukraine. Subsequently, the Company released a portion of this previously established bad debt reserve due to the collection of certain trade receivables, resulting in a bad debt reserve related to PPG's operations in Russia of \$11 million at December 31, 2022. Refer to Note 7, "Impairment and Other Related Charges, Net" for additional information.

21. Reportable Business Segment Information

Segment Organization and Products

PPG is a multinational manufacturer with 10 operating segments (which the Company refers to as “strategic business units”) that are organized based on the Company’s major products lines. The Company’s reportable business segments include the following two segments: Performance Coatings and Industrial Coatings. The operating segments have been aggregated based on economic similarities, the nature of their products, production processes, end-use markets and methods of distribution.

The Performance Coatings reportable business segment is comprised of the automotive refinish coatings, aerospace coatings, architectural coatings – Americas and Asia Pacific, architectural coatings – EMEA, protective and marine coatings and traffic solutions operating segments. This reportable business segment primarily supplies a variety of protective and decorative coatings, adhesives, sealants and finishes, along with paint strippers, stains and related chemicals, pavement marking products, transparencies, transparent armor and paint films.

The Industrial Coatings reportable business segment is comprised of the automotive OEM coatings, industrial coatings, packaging coatings, and the specialty coatings and materials operating segments. This reportable business segment primarily supplies a variety of protective and decorative coatings and finishes along with adhesives, sealants, metal pretreatment products, optical monomers and coatings, low-friction coatings, paint films, precipitated silicas and other specialty materials.

Production facilities and sales for Performance Coatings and Industrial Coatings are global. PPG’s reportable business segments continue to pursue opportunities to further develop their global reach. Each of the reportable business segments in which PPG is engaged is highly competitive. The diversification of our product lines and the worldwide sales tend to minimize the impact on PPG’s business of changes in demand in a particular industry or in a particular geographic area.

The accounting policies of the operating segments are the same as those described in the summary of significant accounting policies (see Note 1, “Summary of Significant Accounting Policies”). The Company allocates resources to operating segments and evaluates the performance of operating segments based upon segment income, which is income before interest expense – net, income taxes, and noncontrolling interests and excludes certain charges which are considered to be unusual or non-recurring. The Company also evaluates performance of operating segments based on working capital management and selling price and sales volume performance.

Corporate unallocated costs include the costs of corporate staff functions not directly associated with the operating segments, certain legal matters, net of related insurance recoveries, the cost of certain insurance and stock-based compensation programs and certain other unusual or non-recurring items. The service cost component of net periodic benefit cost related to current employees of each reportable business segment is allocated to that reportable business segment and the remaining portion of net periodic pension expense is included in the Corporate unallocated costs.

Product movement between Performance Coatings and Industrial Coatings is limited, is accounted for as an inventory transfer, and is recorded at cost plus a mark-up, the impact of which is not significant to the net sales or segment income of the reportable business segments.

(\$ in millions)	2023	2022	2021
Net sales to external customers			
Performance Coatings	\$11,164	\$10,694	\$10,333
Industrial Coatings	7,082	6,958	6,469
Total Net sales	\$18,246	\$17,652	\$16,802
Segment income			
Performance Coatings	\$1,709	\$1,399	\$1,491
Industrial Coatings	966	643	680
Total Segment income	\$2,675	\$2,042	\$2,171
Corporate / Non-Segment Items			
Corporate unallocated	(340)	(218)	(194)
Interest expense, net of interest income	(107)	(113)	(95)
Impairment and other related charges, net ⁽¹⁾	(160)	(245)	(21)
Business restructuring-related costs, net ⁽²⁾	(43)	(75)	(27)
Portfolio optimization ⁽³⁾	(53)	(10)	(86)
Pension settlement charge ⁽⁴⁾	(190)	—	(50)
Environmental remediation charges, net ⁽⁵⁾	(30)	—	(35)
Insurance recoveries ⁽⁶⁾	16	—	—
Argentina currency devaluation losses ⁽⁷⁾	(20)	—	—
Expenses incurred due to natural disasters ⁽⁸⁾	—	—	(17)
Change in allowance for doubtful accounts related to COVID-19	—	—	14
Income from legal settlements	—	—	22
Asbestos-related claims reserve adjustment ⁽⁹⁾	—	—	133
Total Income before income taxes	\$1,748	\$1,381	\$1,815
Depreciation and amortization			
Performance Coatings	\$279	\$296	\$308
Industrial Coatings	213	207	212
Corporate / Non-Segment Items	66	51	41
Total	\$558	\$554	\$561
Share of net earnings of equity affiliates			
Performance Coatings	\$7	\$7	\$5
Industrial Coatings	1	—	—
Corporate / Non-Segment Items	13	18	10
Total	\$21	\$25	\$15
Segment assets⁽¹⁰⁾			
Performance Coatings	\$13,434	\$13,088	\$13,395
Industrial Coatings	5,643	5,802	5,807
Corporate / Non-Segment Items	2,570	1,854	2,149
Total	\$21,647	\$20,744	\$21,351
Investment in equity affiliates			
Performance Coatings	\$48	\$42	\$33
Industrial Coatings	18	15	15
Corporate / Non-Segment Items	75	77	78
Total	\$141	\$134	\$126
Expenditures for property (including business acquisitions)			
Performance Coatings	\$343	\$254	\$1,698
Industrial Coatings	184	313	784
Corporate / Non-Segment Items	131	65	26
Total	\$658	\$632	\$2,508

(\$ in millions)	2023	2022	2021
Geographic Information			
Segment income			
United States and Canada	\$1,048	\$819	\$865
EMEA	679	505	612
Asia Pacific	430	332	354
Latin America	518	386	340
Total	\$2,675	\$2,042	\$2,171
Property, plant and equipment — net			
United States and Canada	\$1,559	\$1,394	\$1,377
EMEA	1,010	943	1,069
Asia Pacific	718	685	702
Latin America	357	306	294
Total	\$3,644	\$3,328	\$3,442

- (1) In the fourth quarter 2023, the company recorded impairment and other related charges due to goodwill impairment recognized for the traffic solutions reporting unit as a result of its annual goodwill impairment test. The fair value of the traffic solutions reporting unit decreased primarily due to increases in the cost of capital (discount rate assumption) and declines in the reporting unit's long-term forecast driven by challenges at its operations in Argentina due to the highly inflationary environment and changes to the reporting unit's global footprint, including the fourth quarter 2023 divestiture of its European and Australian businesses. In 2022, the company recorded impairment and other related charges due to the wind down of the company's operation in Russia. In 2021, impairment charges were recorded for the write-down of certain assets related to the previously planned sale of certain smaller entities in non-strategic regions.
- (2) Business restructuring-related costs, net include business restructuring charges, offset by releases related to previously approved programs, which are included in Other charges/(income), net on the consolidated statement of income, accelerated depreciation of certain assets, which is included in Depreciation on the consolidated statement of income, and other restructuring-related costs, which are included in Cost of sales, exclusive of depreciation and amortization and Selling, general and administrative on the consolidated statement of income. Additionally, there was a \$34 million gain on the sale of certain assets in 2021 in connection with the Company's manufacturing footprint consolidation plans and associated restructuring programs. This gain is included in Other (income)/charges, net in the consolidated statement of income.
- (3) Portfolio optimization includes losses on the sale of non-core assets, including the losses recognized on the sales of the Company's European and Australian traffic solutions businesses in 2023, which are included in Other charges/(income), net in the consolidated statement of income, accelerated amortization expense recognized in 2023 related to the exit of a non-core business, which is included in Amortization in the consolidated statement of income, and the impact for the step up to fair value of inventory acquired in certain acquisitions, which is included in Cost of sales, exclusive of depreciation and amortization in the consolidated statement of income. Portfolio optimization also includes advisory, legal, accounting, valuation, other professional or consulting fees, and certain internal costs directly incurred to effect acquisitions, as well as similar fees and other costs to effect divestitures and other portfolio optimization exit actions. These costs are included in Selling, general and administrative expense in the consolidated statement of income.
- (4) In the first quarter 2023, PPG purchased group annuity contracts that transferred pension benefit obligations for certain of the company's retirees in the U.S. to third-party insurance companies, resulting in a non-cash pension settlement charge. In 2021, the Company purchased group annuity contracts that transferred pension benefit obligations for certain of the Company's retirees in Canada to a third-party insurance company.
- (5) Environmental remediation charges represent environmental remediation costs at certain legacy PPG manufacturing sites. These charges are included in Other charges/(income), net in the consolidated statement of income.
- (6) In the first quarter 2023, the company received reimbursement under its insurance policies for damages incurred at a southern U.S. factory from a winter storm in 2020. In the fourth quarter 2023, the company received reimbursement for a previously approved insurance claim under a policy covering legacy asbestos-related matters. These insurance recoveries are included in Other charges/(income), net in the consolidated statement of income.
- (7) In December 2023, the central bank of Argentina adjusted the official foreign currency exchange rate for the Argentine peso, significantly devaluing the currency relative to the United States dollar. Argentina currency devaluation losses represent foreign currency translation losses recognized during December 2023 related to the devaluation of the Argentine peso, which is included in Other charges/(income), net in the consolidated statement of income.
- (8) In early 2021, a winter storm damaged certain company factories in the southern U.S. Incremental expenses incurred due to these storms included costs related to maintenance and repairs of damaged property, freight and utility premiums and other incremental expenses directly related to the impacted areas. These incremental expenses are included in Other charges/(income), net in the consolidated statement of income.
- (9) In 2021, the reserve for asbestos-related claims was reduced to reflect the Company's current estimate of potential liability for these claims.
- (10) Segment assets are the total assets used in the operation of each segment. Corporate assets principally include amounts recorded in Cash and cash equivalents, Deferred income taxes, and Property, plant and equipment, net on the consolidated balance sheet.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

(a) Evaluation of disclosure controls and procedures.

Based on their evaluation as of the end of the period covered by this Form 10-K, the Company's principal executive officer and principal financial officer have concluded that the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934 (the "Exchange Act")) are effective to ensure that information required to be disclosed by the Company in reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms and to ensure that information required to be disclosed by the 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.

(b) Changes in internal control over financial reporting.

There were no changes in the Company's internal control over financial reporting that occurred during the Company's quarter ended December 31, 2023 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

(c) Management report on internal control over financial reporting.

Refer to Management Report on page 33 for management's annual report on internal control over financial reporting. Refer to Report of Independent Registered Public Accounting Firm on pages 31-32 for PricewaterhouseCoopers LLP's audit report on the Company's internal control over financial reporting.

Item 9B. Other Information

Rule 10b5-1 Trading Plans

During the quarter ended December 31, 2023, none of the Company's directors or officers, as defined in Section 16 of the Securities Exchange Act of 1934, adopted or terminated a "Rule 10b5-1 trading arrangement" or a "non-Rule 10b5-1 trading arrangement," as each term is defined in Item 408(a) of Regulation S-K of the Securities Exchange Act of 1934.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

Part III

Item 10. Directors, Executive Officers and Corporate Governance

The information about the Company's directors required by Item 10 and not otherwise set forth below is contained under the caption "Proposal 1: Election of Directors" in PPG's definitive Proxy Statement for the 2024 Annual Meeting of Shareholders (the "Proxy Statement") which the Company anticipates filing with the Securities and Exchange Commission, pursuant to Regulation 14A, not later than 120 days after the end of the Company's fiscal year, and is incorporated herein by reference.

The executive officers of the Company are elected by the Board of Directors. The information required by this item concerning the Company's executive officers is incorporated by reference herein from Part I of this report under the caption "Information About Our Executive Officers."

Information regarding the Company's Audit Committee is included in the Proxy Statement under the caption "Corporate Governance – Audit Committee" and is incorporated herein by reference.

Information regarding the Company's codes of ethics is included in the Proxy Statement under the caption "Corporate Governance – Codes of Ethics" and is incorporated herein by reference.

Item 11. Executive Compensation

The information required by Item 11 is contained in the Proxy Statement under the captions "Compensation of Directors," "Compensation Discussion and Analysis," "Compensation of Executive Officers," "Potential Payments upon Termination or Change in Control," "Corporate Governance – Compensation Committee Interlocks and Insider Participation," and "Corporate Governance – Human Capital Management and Compensation Committee Report to Shareholders" and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by Item 12 is contained in the Proxy Statement under the captions “Beneficial Ownership” and “Equity Compensation Plan Information” and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by Item 13 is contained in the Proxy Statement under the captions “Corporate Governance – Director Independence,” “Corporate Governance – Review and Approval or Ratification of Transactions with Related Persons” and “Corporate Governance – Certain Relationships and Related Transactions” and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

The information required by Item 14 is contained in the Proxy Statement under the caption “Independent Registered Public Accounting Firm” and is incorporated herein by reference.

Part IV

Item 15. Exhibits, Financial Statement Schedules

(a)(1) Consolidated Financial Statements and Reports of Independent Registered Public Accounting Firm (see Part II, Item 8 of this Form 10-K).

The following information is filed as part of this Form 10-K:

	Page
Report of Independent Registered Public Accounting Firm (PCAOB ID 238)	##
Management Report	33
Consolidated Statement of Income for the Years Ended December 31, 2023, 2022 and 2021	34
Consolidated Statement of Comprehensive Income for the Years Ended December 31, 2023, 2022 and 2021	34
Consolidated Balance Sheet as of December 31, 2023 and 2022	35
Consolidated Statement of Shareholders' Equity for the Years Ended December 31, 2023, 2022 and 2021	36
Consolidated Statement of Cash Flows for the Years Ended December 31, 2023, 2022 and 2021	37
Notes to the Consolidated Financial Statements	38

(a)(2) Consolidated Financial Statement Schedule for the years ended December 31, 2023, 2022 and 2021.

The following Consolidated Financial Statement Schedule should be read in conjunction with the previously referenced financial statements:

Schedule II – Valuation and Qualifying Accounts

Allowance for Doubtful Accounts for the Years Ended December 31, 2023, 2022, and 2021

(\$ in millions)	Balance at Beginning of Year	Charged to Costs and Expenses(1)	Deductions(1, 2)	Balance at End of Year
2023	\$31	\$17	(\$23)	\$25
2022	\$31	\$52	(\$52)	\$31
2021	\$44	\$5	(\$18)	\$31

(1) In the first quarter 2022, PPG recorded a bad debt reserve of \$43 million associated with the adverse economic impacts of the Russian invasion of Ukraine. Subsequently, the Company released a portion of this previously established bad debt reserve due to the collection of certain trade receivables. In 2020, PPG recorded an allowance for doubtful accounts of \$30 million related to the potential financial impacts of COVID-19. In 2021, PPG released a portion of the previously established reserve due to improvement in economic conditions in certain countries and a slower pattern of bankruptcies than expected.

(2) Notes and accounts receivable written off as uncollectible, net of recoveries, amounts attributable to divestitures and changes attributable to foreign currency translation.

All other schedules are omitted because they are not applicable.

(a)(3) Exhibits. The following exhibits are filed as a part of, or incorporated by reference into, this Form 10-K.

Index to Exhibits

- 3 Statement with Respect to Shares Eliminating the Series A Junior Participating Preferred Stock, was filed as Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q for the period ended September 30, 2014.
- 3.1 Restated Articles of Incorporation of PPG Industries, Inc., was filed as Exhibit 3.2 to the Registrant's Quarterly Report on Form 10-Q for the period ended September 30, 2014.
- 3.2 Articles of Amendment to the Restated Articles of Incorporation of PPG Industries, Inc., effective May 13, 2022, was filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed on May 13, 2022.
- 3.3 Amended and Restated Bylaws of PPG Industries, Inc., as amended on January 18, 2024, was filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed on January 22, 2024.
- 4 Indenture, dated as of March 18, 2008, was filed as Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed on March 18, 2008.
- 4.1 Supplemental Indenture, dated as of March 18, 2008, was filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed on March 18, 2008.
- 4.2 Second Supplemental Indenture, dated as of November 12, 2010, was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on November 12, 2010.
- 4.3 Third Supplemental Indenture, dated as of August 3, 2012, was filed as Exhibit 4.4 to the Registrant's Current Report on Form 8-K filed on August 3, 2012.
- 4.4 Fifth Supplemental Indenture, dated as of March 13, 2015, between PPG Industries, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee, was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on March 13, 2015.
- 4.5 Sixth Supplemental Indenture, dated as of November 3, 2016, between PPG Industries, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee, was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on November 3, 2016.
- 4.6 Seventh Supplemental Indenture, dated as of February 27, 2018, between PPG Industries, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee, was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on February 27, 2018.
- 4.7 Eighth Supplemental Indenture, dated as of August 15, 2019, between PPG Industries, Inc. and The Bank of New York Mellon Trust Company, N.A., was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on August 15, 2019.
- 4.8 Ninth Supplemental Indenture, dated as of May 19, 2020, between PPG Industries, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee, was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on May 19, 2020.
- 4.9 Tenth Supplemental Indenture, dated as of March 4, 2021, between PPG Industries, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee, was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on March 4, 2021.
- 4.10 Eleventh Supplemental Indenture, dated as of May 25, 2022, between PPG Industries, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee, was filed as Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed on May 25, 2022.
- † 4.11 PPG Industries, Inc. Description of Securities.
- * 10 PPG Industries, Inc. Nonqualified Retirement Plan, as amended and restated September 24, 2008, was filed as Exhibit 10 to the Registrant's Annual Report on Form 10-K for the period ended December 31, 2011.
- * 10.1 Form of Change in Control Employment Agreement entered into with executives on or after January 1, 2008 through December 31, 2009, was filed as Exhibit 10.24 to the Registrant's Annual Report on Form 10-K for the period ended December 31, 2007.
- * 10.2 Form of Change in Control Employment Agreement entered into with executives on or after January 1, 2010, was filed as Exhibit 10.3 to the Registrant's Annual Report on Form 10-K for the period ended December 31, 2009.
- * 10.3 Form of Change in Control Employment Agreement entered into with executives on or after June 30, 2012 was filed as Exhibit 10.4 to the Registrant's Annual Report on Form 10-K for the period ended December 31, 2012.
- * 10.4 Form of Change in Control Employment Agreement entered into with executives on or after January 1, 2014, was filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the period ended March 31, 2014.

- * 10.5 PPG Industries, Inc. Deferred Compensation Plan for Directors related to compensation deferred prior to January 1, 2005, was filed as Exhibit 10.3 to the Registrant's Annual Report on Form 10-K for the period ended December 31, 1997.
- † 10.6 PPG Industries, Inc. Deferred Compensation Plan for Directors related to compensation deferred on or after January 1, 2005, as amended and restated effective January 1, 2024.
- * 10.7 PPG Industries, Inc. Deferred Compensation Plan related to compensation deferred prior to January 1, 2005, as amended effective July 14, 2004, was filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the period ended June 30, 2004.
- * 10.8 PPG Industries, Inc. Deferred Compensation Plan related to compensation deferred on or prior to January 1, 2005, as amended and restated effective January 1, 2011, was filed as Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the period ended June 30, 2012.
- * 10.9 PPG Industries, Inc. Executive Officers' Long Term Incentive Plan was filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K dated February 15, 2005.
- * 10.10 PPG Industries, Inc. Amended and Restated Omnibus Incentive Plan, was filed as Annex A to the Registrant's Definitive Proxy Statement for its 2011 Annual Meeting of Shareholders filed on March 10, 2011.
- * 10.11 PPG Industries, Inc. Amended and Restated Omnibus Incentive Plan, was filed as Annex B to the Registrant's Definitive Proxy Statement for its 2016 Annual Meeting of Shareholders filed on March 10, 2016.
- †* 10.12 Form of Non-Qualified Stock Option Award Agreement.
- †* 10.13 Form of TSR Share Award Agreement.
- †* 10.14 Form of Performance-Based Restricted Stock Unit Award Agreement.
- †* 10.15 Form of Time-Vested Restricted Stock Unit Award Agreement.
- †* 10.16 Form of Time-Vested Restricted Stock Unit Award Agreement for Directors.
- 10.17 Amended and Restated Five Year Credit Agreement dated as of August 30, 2019 among PPG Industries, Inc.; the several banks and financial institutions party thereto; JPMorgan Chase Bank, N.A., as administrative agent; BNP Paribas, Citibank, N.A. MUFG Bank, Ltd. and PNC Bank, National Association, as co-syndication agents; and J.P. Morgan Chase Bank, N.A., BNP Paribas Securities Corp., Citibank, N.A., MUFG Bank, Ltd. and PNC Capital Markets LLC, as co-lead arrangers and co-bookrunners, was filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on September 4, 2019.
- 10.18 Amendment No. 1, dated as of March 23, 2023, to Five Year Credit Agreement, dated as of August 30, 2019, among PPG Industries, Inc.; the several banks and financial institutions party thereto; JPMorgan Chase Bank, N.A., as administrative agent; BNP Paribas, Citibank, N.A., MUFG Bank, Ltd. and PNC Bank, National Association, as co-syndication agents; and J.P. Morgan Chase Bank, N.A., BNP Paribas Securities Corp., Citibank, N.A., MUFG Bank, Ltd. and PNC Capital Markets LLC, as co-lead arrangers and co-bookrunners was filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on March 27, 2023.
- 10.19 Term Loan Credit Agreement, dated as of February 19, 2021, among PPG Industries, Inc., the lenders parties thereto, BNP Paribas, as administrative agent, PNC Bank, National Association as syndication agent and BNP Paribas Securities Corp. and PNC Capital Markets LLC as co-lead arrangers and co-bookrunners was filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on February 23, 2021.
- 10.20 Amendment No. 1, dated as of March 23, 2023, to Term Loan Credit Agreement, dated as of February 19, 2021, among PPG Industries, Inc., the lenders parties thereto, BNP Paribas, as administrative agent, PNC Bank, National Association, as syndication agent and BNP Paribas Securities Corp. and PNC Capital Markets LLC, as co-lead arrangers and co-bookrunners was filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed on March 27, 2023.
- 10.21 Term Loan Credit Agreement, dated as of April 12, 2023, among PPG Industries, Inc., the banks, financial institutions and other institutional lenders party thereto and Banco Bilbao Vizcaya Argentaria, S.A. New York Branch, as administrative agent was filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on April 18, 2023.

- 10.22 Five Year Credit Agreement dated as of July 27, 2023 among PPG Industries, Inc.; the several banks and financial institutions party thereto; JPMorgan Chase Bank, N.A., as administrative agent; JPMorgan Chase Bank, N.A., PNC Capital Markets LLC, BNP Paribas Securities Corp, and Citibank, N.A. as joint lead arrangers and joint bookrunners; PNC Bank, National Association, BNP Paribas, and Citibank, N.A., as co-syndication agents; and Banco Bilbao Vizcaya Argentaria, S.A. New York Branch, Banco Santander, S.A., New York Branch, Bank of America, N.A., Goldman Sachs Bank USA, HSBC Bank USA, National Association, Intesa Sanpaolo S.P.A., New York Branch, Societe Generale, Sumitomo Mitsui Banking Corporation, The Toronto-Dominion Bank, New York Branch, Unicredit Bank AG, New York Branch, U.S. Bank National Association, and Wells Fargo Bank, National Association, as co-documentation agents was filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on July 31, 2023.
- * 10.23 PPG Industries, Inc. Incentive Compensation Plan for Key Employees, as amended and restated on January 1, 2019 was filed as Exhibit 10.29 to the Registrant's Annual Report on Form 10-K for the period ended December 31, 2018.
- * 10.24 PPG Industries, Inc. Management Award Plan, as amended and restated on January 1, 2019 was filed as Exhibit 10.30 to the Registrant's Annual Report on Form 10-K for the period ended December 31, 2018.
- * 10.25 Time-Vested Restricted Stock Unit Award Agreement for Michael H. McGarry was filed as Exhibit 10.25 to the Registrant's Annual Report on Form 10-K for the period ended December 31, 2022.
- † 13.1 Market Information, Dividends, Holders of Common Stock and Stock Performance Graph.
- † 21 Subsidiaries of the Registrant.
- † 23 Consent of PricewaterhouseCoopers LLP.
- † 24 Powers of Attorney.
- † 31.1 Certification of Principal Executive Officer Pursuant to Rule 13a-14(a) or 15d-14(a) of the Exchange Act, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- † 31.2 Certification of Principal Financial Officer Pursuant to Rule 13a-14(a) or 15d-14(a) of the Exchange Act, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- †† 32.1 Certification of Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
- †† 32.2 Certification of Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
- † 97.1 PPG Industries, Inc. Compensation Recovery Policy Adopted by the Board of Directors on July 20, 2023
- ** 101.INS Inline XBRL Instance Document
- ** 101.SCH Inline XBRL Taxonomy Extension Schema Document
- ** 101.CAL Inline XBRL Taxonomy Extension Calculation Linkbase Document
- ** 101.DEF Inline XBRL Taxonomy Extension Definition Linkbase Document
- ** 101.LAB Inline XBRL Taxonomy Extension Label Linkbase Document
- ** 101.PRE Inline XBRL Taxonomy Extension Presentation Linkbase Document
- 104 Inline XBRL for the cover page of this Annual Report on Form 10-K, included in the Exhibit 101 Inline XBRL Document Set.
- † Filed herewith.
- †† Furnished herewith.
- * Management contracts, compensatory plans or arrangements required to be filed as an exhibit hereto pursuant to Item 601 of Regulation S-K.
- ** Attached as Exhibit 101 to this report are the following documents formatted in Inline XBRL (Extensible Business Reporting Language) as of and for the year ended December 31, 2023: (i) the Consolidated Statement of Income, (ii) the Consolidated Balance Sheet, (iii) the Consolidated Statement of Shareholders' Equity, (iv) the Consolidated Statement of Comprehensive Income (Loss), (v) the Consolidated Statement of Cash Flows, (vi) Notes to Consolidated Financial Statements and (vii) Financial Schedule of Valuation and Qualifying Accounts.

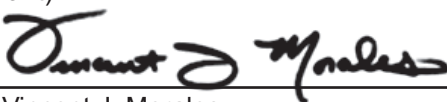
Item 16. Form 10-K Summary


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 on February 15, 2024.


PPG INDUSTRIES, INC.
(Registrant)


By: 
 Vincent J. Morales
 Senior Vice President and Chief Financial Officer (Principal Financial Officer and Duly Authorized Officer)


By: 
 Brian R. Williams
 Vice President and Controller (Principal Accounting Officer and Duly Authorized Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed by the following persons on behalf of the Registrant and in the capacities indicated on February 15, 2024.

Signature	Capacity
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 Timothy M. Knavish	Chairman and Chief Executive Officer
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 Vincent J. Morales	Senior Vice President and Chief Financial Officer (Principal Financial Officer and Duly Authorized Officer)
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 Brian R. Williams	Vice President and Controller (Principal Accounting Officer and Duly Authorized Officer)
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S. F. Angel	Director
M. L. Healey	Director
G. R. Heminger	Director
M. W. Lamach	Director
K. A. Ligocki	Director
M. T. Nally	Director
G. Novo	Director
M. H. Richenhagen	Director
C. N. Roberts III	Director
C. R. Smith	Director

By: 
 Vincent J. Morales, Attorney-in-Fact

Certifications

PRINCIPAL EXECUTIVE OFFICER CERTIFICATION

I, Timothy M. Knavish, certify that:

1. I have reviewed this annual report on Form 10-K of PPG Industries, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.



Timothy M. Knavish

Chairman and Chief Executive Officer

February 15, 2024

PRINCIPAL FINANCIAL OFFICER CERTIFICATION

I, Vincent J. Morales, certify that:

1. I have reviewed this annual report on Form 10-K of PPG Industries, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.



Vincent J. Morales

Senior Vice President and Chief Financial Officer
(Principal Financial Officer and Duly Authorized Officer)
February 15, 2024

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the annual report on Form 10-K of PPG Industries, Inc. for the period ended December 31, 2023 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Timothy M. Knavish, Chairman and Chief Executive Officer of PPG Industries, Inc., certify to the best of my knowledge, pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of PPG Industries, Inc.



Timothy M. Knavish
Chairman and Chief Executive Officer
February 15, 2024

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the annual report on Form 10-K of PPG Industries, Inc. for the period ended December 31, 2023 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Vincent J. Morales, Senior Vice President and Chief Financial Officer of PPG Industries, Inc., certify to the best of my knowledge, pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of PPG Industries, Inc.



Vincent J. Morales
Senior Vice President and Chief Financial Officer
(Principal Financial Officer and Duly Authorized Officer)
February 15, 2024

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2023 Highlights

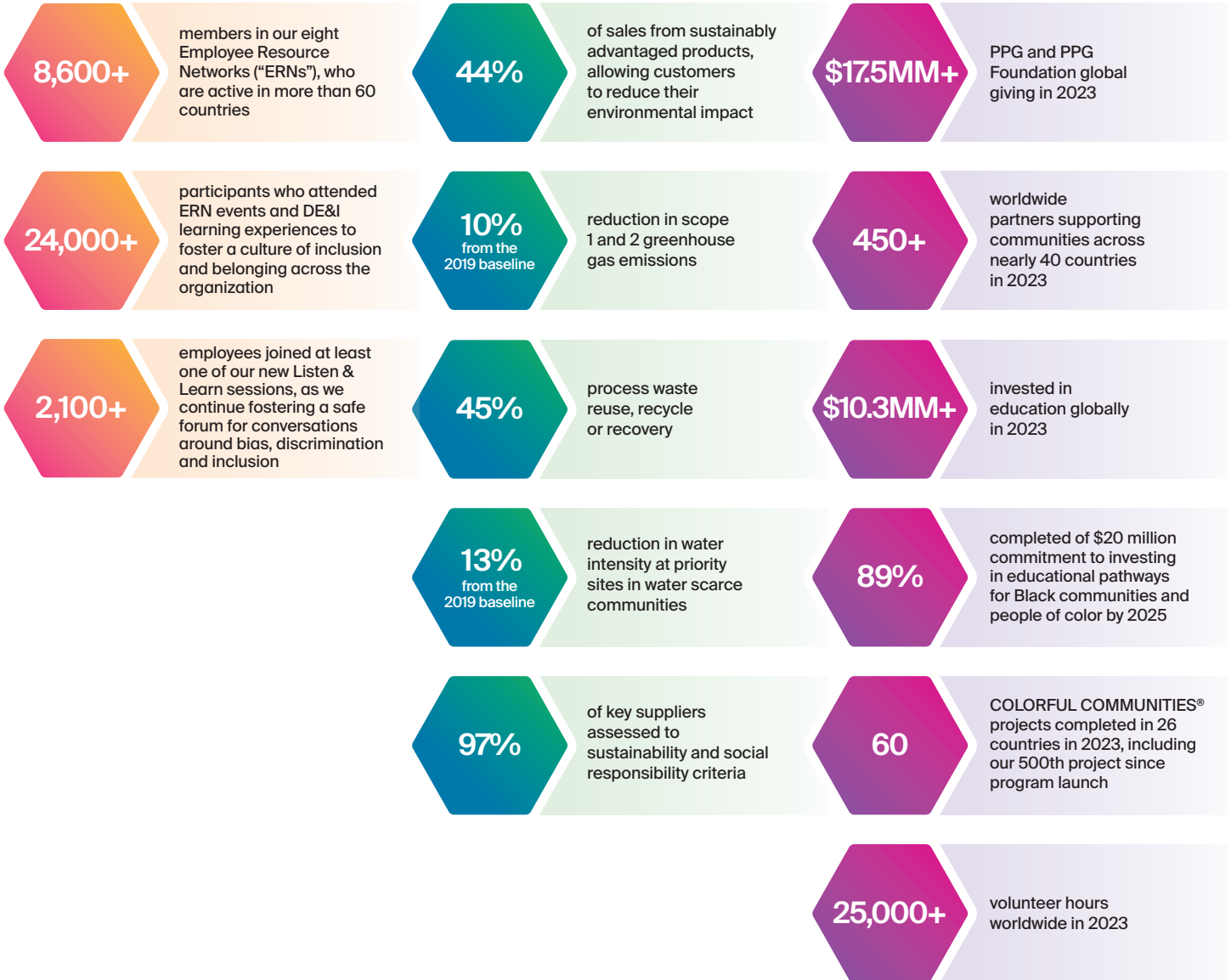
Our Culture



Sustainability



Our Communities



Board of Directors

Timothy M. Knavish
Chairman and Chief Executive Officer, PPG

Melanie L. Healey
Former Group President, North America, The Procter & Gamble Company

Gary R. Heminger
Retired Chairman of the Board and Chief Executive Officer, Marathon Petroleum Corporation

Michael W. Lamach
Retired Executive Chair and Chief Executive Officer, Trane Technologies plc

Kathleen A. Ligocki
Former Chief Executive Officer, Agility Fuel Solutions, LLC

Michael T. Nally
CEO, Generata Biomedicines, Inc. and CEO-Partner, Flagship Pioneering

Guillermo Novo
Chairman and Chief Executive Officer, Ashland Global Holdings Inc.

Martin H. Richenhagen
Retired Chairman, President and Chief Executive Officer of AGCO Corporation

Christopher N. Roberts III
Executive Vice President and General Manager, Global Food and Beverage, Ecolab Inc.

Catherine R. Smith
Chief Financial Officer and Treasurer, Nordstrom, Inc.



As part of PPG's ongoing sustainability efforts, the 2023 Annual Report is printed on post-consumer recycled paper. To read the full version of the report with expanded content, please visit annualreport.ppg.com.

