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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2022

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 No. 1-768

CATERPILLAR INC.

(Exact name of Registrant as specified in its charter)

Delaware**37-0602744**

(State or other jurisdiction of incorporation)

(IRS Employer I.D. No.)

5205 N. O'Connor Boulevard, Suite 100, Irving, Texas 75039

(Address of principal executive offices)

(Zip Code)

Registrant's telephone number, including area code: **(972) 891-7700**

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

Title of each class	Trading Symbol (s)	Name of each exchange on which registered	
Common Stock (\$1.00 par value)	CAT	New York Stock Exchange	(1)
8% Debentures due February 15, 2023	CAT23	New York Stock Exchange	
5.3% Debentures due September 15, 2035	CAT35	New York Stock Exchange	

⁽¹⁾ In addition to the New York Stock Exchange, Caterpillar common stock is also listed on stock exchanges in France and Switzerland.

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 (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

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

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or 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):

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Originally organized as Caterpillar Tractor Co. in 1925 in the State of California, our company was reorganized as Caterpillar Inc. in 1986 in the State of Delaware. As used herein, the term "Caterpillar," "we," "us," "our" or "the company" refers to Caterpillar Inc. and its subsidiaries unless designated or identified otherwise.

Overview

With 2022 sales and revenues of \$59.427 billion, Caterpillar is the world's leading manufacturer of construction and mining equipment, off-highway diesel and natural gas engines, industrial gas turbines and diesel-electric locomotives. The company principally operates through its three primary segments - Construction Industries, Resource Industries and Energy & Transportation - and also provides financing and related services through its Financial Products segment. Caterpillar is also a leading U.S. exporter. Through a global network of independent dealers and direct sales of certain products, Caterpillar builds long-term relationships with customers around the world.

Enterprise Strategy

Our company strategy, rolled out in 2017, reflects our legacy and our continuing commitment to meet the needs of our customers and the communities in which we live and work. United by our Values, Caterpillar employees around the world share a focused view of our business through the Operating & Execution Model, through which we are making strategic choices today to create long-term profitable growth. Since 2017, we focused on three strategic areas: Expanded Offerings, Operational Excellence and Services. In 2022, we updated our strategy to also include sustainability as a strategic focus area. For nearly 100 years, our longstanding commitment to sustainability has inspired us to set and achieve meaningful environmental, social and governance goals. It's also allowed us to develop innovative products, technologies and services to support our customers on their sustainability journey. The addition of sustainability as a focus area, together with operational excellence, expanded offerings and services, highlights our work to help customers build a better, more sustainable world.

Currently, we have five operating segments, of which four are reportable segments and are described below.

Categories of Business Organization

1. **Machinery, Energy & Transportation** — Caterpillar Inc. and its subsidiaries, excluding Financial Products. Machinery, Energy & Transportation information relates to the design, manufacturing and marketing of our products.

2. **Financial Products** — Our finance and insurance subsidiaries, primarily Caterpillar Financial Services Corporation (Cat Financial) and Caterpillar Insurance Holdings Inc. (Insurance Services). Financial Products information relates to the financing to customers and dealers for the purchase and lease of Caterpillar and other equipment.

Other information about our operations in 2022, including certain risks associated with our operations, is included in Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Construction Industries

Our Construction Industries segment is primarily responsible for supporting customers using machinery in infrastructure, forestry and building construction. The majority of machine sales in this segment are made in the heavy and general construction, rental, quarry and aggregates markets and mining.

The nature of customer demand for construction machinery varies around the world. Customers in developing economies often prioritize purchase price in making their investment decisions, while customers in developed economies generally weigh productivity and other performance criteria that contribute to lower owning and operating costs over the lifetime of the machine. To meet customer expectations in developing economies, Caterpillar developed differentiated product offerings that target customers in those markets, including our SEM brand machines. We believe that these customer-driven product innovations enable us to compete more effectively in developing economies. The majority of Construction Industries' research and development spending in 2022 focused on the next generation of construction machines.

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The competitive environment for construction machinery is characterized by some global competitors and many regional and specialized local competitors. Examples of global competitors include CASE (part of CNH Industrial N.V.), Deere Construction & Forestry (part of Deere & Company), Doosan Bobcat (Part of Doosan Group), Hitachi Construction Machinery Co., Ltd., Hyundai Construction Equipment Co., Ltd., Hyundai Doosan Infracore Co., Ltd. (both part of Hyundai Heavy Industries Group), J.C. Bamford Excavators Ltd., Kobelco Construction Machinery (part of Kobe Steel, Ltd), Komatsu Ltd., Kubota Farm & Industrial Machinery (part of Kubota Corporation), Sany Heavy Industry Co., Ltd., and Volvo Construction Equipment (part of the Volvo Group). As an example of regional and local competitors, our competitors in China also include Guangxi LiuGong Machinery Co., Ltd., Longking Holdings Ltd., Sany Heavy Industry Co, XCMG Construction Machinery Co., Ltd., Shandong Lingong Construction Machinery Co., Ltd. (SDLG, JV with Volvo Construction Equipment) and Shantui Construction Machinery Co., Ltd., (part of Shandong Heavy Industry Group Co.). Each of these companies has varying product lines that compete with Caterpillar products, and each has varying degrees of regional focus.

The Construction Industries product portfolio includes the following product families as well as related parts and tools:

- asphalt pavers
- backhoe loaders
- cold planers
- compact, small and medium wheel loaders
- compact track and multi-terrain loaders
- compactors
- forestry machines
- material handlers
- mini, small, medium and large track excavators
- motor graders
- pipelayers
- road reclaimers
- skid steer loaders
- small and medium track-type tractors
- telehandlers
- track-type loaders
- wheel excavators

Resource Industries

The Resource Industries segment is primarily responsible for supporting customers using machinery in mining and heavy construction and quarry and aggregates. Caterpillar offers a broad product range and services to deliver comprehensive solutions for our customers. We develop and manufacture high productivity equipment for both surface and underground mining operations around the world, as well as provide hydraulic systems, electronics and software for Caterpillar machines and engines. Our equipment is used to extract and haul copper, iron ore, coal, oil sands, aggregates, gold and other minerals and ores, as well as a variety of heavy construction applications. In addition to equipment, Resource Industries also develops and sells technology products and services to provide customers fleet management systems, equipment management analytics and autonomous machine capabilities.

Customers in most markets place an emphasis on equipment that is highly productive, reliable and provides the lowest total cost of ownership over the life of the equipment. In some developing markets, customers often prioritize purchase price in making their investment decisions. We believe our ability to control the integration and design of key machine components and innovative technologies represents a competitive advantage. Our research and development efforts remain focused on providing customers the lowest total cost of ownership enabled through the highest quality, most productive products and services in the industry.

The competitive environment for Resource Industries consists of a few larger global competitors that compete in several of the markets that we serve and a substantial number of smaller companies that compete in a more limited range of products, applications, and regional markets. Our global surface competitors include Deere Construction & Forestry (part of Deere & Company), Epiroc AB, Hitachi Construction Machinery Co., Ltd., Komatsu Ltd., Liebherr-International AG, Sandvik AB, and Volvo Construction Equipment. Our global underground competitors include Epiroc AB, Komatsu Ltd., and Sandvik AB.

The Resource Industries product portfolio includes the following machines and related parts and services:

- electric rope shovels
- draglines
- hydraulic shovels
- rotary drills
- hard rock vehicles
- large track-type tractors
- large mining trucks
- longwall miners
- large wheel loaders
- off-highway trucks
- articulated trucks
- wheel tractor scrapers
- wheel dozers
- fleet management
- landfill compactors
- soil compactors
- machinery components
- autonomous ready vehicles and solutions
- select work tools
- safety services and mining performance solutions

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Energy & Transportation

Our Energy & Transportation segment supports customers in oil and gas, power generation, marine, rail and industrial applications, including Caterpillar machines. The product and services portfolio includes reciprocating engines, generator sets, integrated systems and solutions, turbines and turbine-related services, electrified powertrain and zero-emission power sources and service solutions development, the remanufacturing of Caterpillar engines and components and remanufacturing services for other companies, diesel-electric locomotives and other rail-related products and services and product support of on-highway vocational trucks for North America.

Regulatory emissions standards require us to continue to make investments as new products and new regulations are introduced. Ongoing compliance with these regulations remains a focus. Emissions compliance in developing markets is complex due to rapidly evolving and unique requirements where enforcement processes can often vary. We employ robust product development, manufacturing processes and testing to help us comply with these regulations.

The competitive environment for reciprocating engines in marine, oil and gas, industrial and electric power generation systems along with turbines in oil and gas and electric power generation consists of a few larger global competitors that compete in a variety of markets that Caterpillar serves, and a substantial number of smaller companies that compete in a limited-size product range, geographic region and/or application. Principal global competitors include Cummins Inc., Deutz AG, INNIO Jenbacher GmbH, Rolls-Royce Power Systems and Wärtsilä Corp. Other competitors, such as Fiat Industrial SpA (Iveco Group), GE Power, Kawasaki Heavy Industries Energy Solutions & Marine Engineering, MAN Energy Solutions (VW), Mitsubishi Heavy Industries Ltd., Siemens Energy Global GmbH, Volvo Penta AB, Weichai Power Co., Ltd., and other emerging market competitors compete in certain markets in which Caterpillar competes. An additional set of competitors, including Aggreko plc, Baker Hughes Co., Generac Holdings, Kohler Power Systems, and others, are primarily packagers who source engines and/or other components from domestic and international suppliers and market products regionally and internationally through a variety of distribution channels. In rail-related businesses, our global competitors include Alstom SA, CRRC Corp., LTD., The Greenbrier Companies, Siemens Mobility, Voestalpine AG, Vossloh AG and Wabtec Freight. We also compete with other companies on a more limited range of products, services and/or geographic regions.

The Energy & Transportation portfolio includes the following products and related parts:

- Reciprocating engine powered generator sets
- Reciprocating engines, drivetrain and integrated systems and solutions supplied to the industrial industry as well as Caterpillar machinery
- Integrated systems and solutions used in the electric power generation industry
- Turbines, centrifugal gas compressors and related services
- Reciprocating engines, drivetrain and integrated systems and solutions for the marine and oil and gas industries
- Remanufactured reciprocating engines and components
- Diesel-electric locomotives and components and other rail-related products and services

Financial Products Segment

The business of our Financial Products Segment is primarily conducted by Cat Financial, Insurance Services and their respective subsidiaries and affiliates. Cat Financial is a wholly owned finance subsidiary of Caterpillar Inc. and it provides retail and wholesale financing to customers and dealers around the world for Caterpillar products and services, as well as financing for vehicles and power generation facilities that, in most cases, incorporate Caterpillar products. Retail financing is primarily comprised of installment sale contracts and other equipment-related loans, working capital loans, finance leases and operating leases. Wholesale financing to Caterpillar dealers consists primarily of inventory and rental fleet financing. In addition, Cat Financial purchases short-term wholesale trade receivables from Caterpillar. The various financing plans offered by Cat Financial are designed to support sales of Caterpillar products and services and generate financing income for Cat Financial. A significant portion of our activity is conducted in North America and we have additional offices and subsidiaries in Latin America, Asia/Pacific, Europe and Africa.

For over 40 years, Cat Financial has been providing financing for Caterpillar products, contributing to our knowledge of asset values, industry trends, financing structures and customer needs.

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In certain instances, Cat Financial's operations are subject to supervision and regulation by state, federal and various foreign governmental authorities, and may be subject to various laws and judicial and administrative decisions imposing various requirements and restrictions which, among other things, (i) regulate credit granting activities and the administration of loans, (ii) establish maximum interest rates, finance charges and other charges, (iii) require disclosures to customers, (iv) govern secured transactions, (v) set collection, foreclosure, repossession and other trade practices and (vi) regulate the use and reporting of information related to a borrower's credit experience. Cat Financial's ability to comply with these and other governmental and legal requirements and restrictions affects its operations.

Cat Financial's retail loans include:

- Loans that allow customers and dealers to use their Caterpillar equipment or other assets as collateral to obtain financing.
- Installment sale contracts, which are equipment loans that enable customers to purchase equipment with structured payments over time.

Cat Financial's retail leases include:

- Finance (non-tax) leases, where the lessee for tax purposes is considered to be the owner of the equipment during the term of the lease, that either require or allow the customer to purchase the equipment for a fixed price at the end of the term.
- Tax leases that are classified as either operating or finance leases for financial accounting purposes, depending on the characteristics of the lease. For tax purposes, we are considered the owner of the equipment.

Cat Financial also purchases short-term receivables from Caterpillar.

Cat Financial's wholesale loans and leases include inventory/rental programs, which provide assistance to dealers by financing their new Caterpillar inventory and rental fleets.

Cat Financial operates in a highly competitive environment, with financing for users of Caterpillar equipment and services available through a variety of sources, principally commercial banks and finance and leasing companies. Our competitors include Wells Fargo Equipment Finance Inc., Banc of America Leasing & Capital LLC, BNP Paribas Leasing Solutions Limited, Australia and New Zealand Banking Group Limited, Société Générale S.A. and various other banks and finance companies. In addition, many of the manufacturers that compete with Caterpillar also own financial subsidiaries, such as John Deere Capital Corporation, Komatsu Financial L.P., Volvo Financial Services and Kubota Credit Corporation, which utilize many below-market interest rate programs (funded by the manufacturer) to support machine sales. Cat Financial works with the broader Caterpillar organization to provide a broad array of financial merchandising programs to compete around the world.

The financial results of Cat Financial are largely dependent upon the ability of Caterpillar dealers to sell equipment and customers' willingness to enter into financing or leasing agreements. Cat Financial is also affected by, among other things, the availability of funds from its financing sources, its cost of funds relative to its competitors and general economic conditions such as inflation and market interest rates.

Cat Financial has a match-funding policy that addresses interest rate risk by aligning the interest rate profile (fixed or floating rate and duration) of its debt portfolio with the interest rate profile of its receivables portfolio within predetermined ranges on an ongoing basis. In connection with that policy, Cat Financial uses interest rate derivative instruments to modify the debt structure to match assets within the receivables portfolio. This matched funding reduces the volatility of margins between interest-bearing assets and interest-bearing liabilities, regardless of which direction interest rates move. For more information regarding match funding, please see Note 4 — "Derivative financial instruments and risk management" of Part II, Item 8 "Financial Statements and Supplementary Data." See also the risk factors associated with our financial products business included in Item 1 A. of this Form 10-K.

In managing foreign currency risk for Cat Financial's operations, the objective is to minimize earnings volatility resulting from conversion and the remeasurement of net foreign currency balance sheet positions, and future transactions denominated in foreign currencies. This policy allows the use of foreign currency forward, option and cross currency contracts to offset the risk of currency mismatch between the assets and liabilities, and exchange rate risk associated with future transactions denominated in foreign currencies.

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Cat Financial provides financing only when certain criteria are met. Credit decisions are based on a variety of credit quality factors including prior payment experience, customer financial information, credit ratings, loan-to-value ratios and other internal metrics. Cat Financial typically maintains a security interest in retail-financed equipment and requires physical damage insurance coverage on financed equipment. Cat Financial finances a significant portion of Caterpillar dealers' sales and inventory of Caterpillar equipment throughout the world. Cat Financial's competitive position is improved by marketing programs offered in conjunction with Caterpillar and/or Caterpillar dealers. Under these programs, Caterpillar, or the dealer, funds an amount at the outset of the transaction, which Cat Financial then recognizes as revenue over the term of the financing. We believe that these marketing programs provide Cat Financial a significant competitive advantage in financing Caterpillar products.

Caterpillar Insurance Company, a wholly owned subsidiary of Caterpillar Insurance Holdings Inc., is a U.S. insurance company domiciled in Missouri and primarily regulated by the Missouri Department of Insurance. Caterpillar Insurance Company is licensed to conduct property and casualty insurance business in 50 states, the District of Columbia and Guam, and as such, is also regulated in those jurisdictions. The State of Missouri acts as the lead regulatory authority and monitors Caterpillar Insurance Company's financial status to ensure that it is in compliance with minimum solvency requirements, as well as other financial ratios prescribed by the National Association of Insurance Commissioners. Caterpillar Insurance Company is also licensed to conduct insurance business through a branch in Zurich, Switzerland and, as such, is regulated by the Swiss Financial Market Supervisory Authority.

Caterpillar Life Insurance Company, a wholly owned subsidiary of Caterpillar, is a U.S. insurance company domiciled in Missouri and primarily regulated by the Missouri Department of Insurance. Caterpillar Life Insurance Company is licensed to conduct life and accident and health insurance business in 26 states and the District of Columbia and, as such, is also regulated in those jurisdictions. The State of Missouri acts as the lead regulatory authority and it monitors the financial status to ensure that it is in compliance with minimum solvency requirements, as well as other financial ratios prescribed by the National Association of Insurance Commissioners. Caterpillar Life Insurance Company provides reinsurance coverage to Caterpillar Insurance Company. Specifically, Caterpillar Life Insurance Company has entered into a reinsurance agreement with Caterpillar Insurance Company, assuming 100% of the risk of an Accident and Health Stop Loss Insurance Policy to cover a Caterpillar Voluntary Employees' Benefits Association (VEBA) Trust for medical losses sustained by a select group of Caterpillar retirees and dependents.

Caterpillar Insurance Co. Ltd., a wholly owned subsidiary of Caterpillar Insurance Holdings Inc., is a captive insurance company domiciled in Bermuda and regulated by the Bermuda Monetary Authority. Caterpillar Insurance Co. Ltd. is registered as a Class 2 (General Business) and Class B (Long-Term) insurer with the Bermuda Monetary Authority. Under its Class 2 insurance license, Caterpillar Insurance Co. Ltd. insures its parent and affiliates for general liability, property, auto liability and cargo. It also provides reinsurance to Caterpillar Insurance Company under a quota share reinsurance agreement for its contractual liability and contractors' equipment programs in the United States. In addition, Caterpillar Insurance Co. Ltd. reinsures 100% of the international employee benefit plans of Caterpillar Inc. through retrocession agreements with other insurers. The employee benefits coverages include medical and accident coverages, which are reported under its Class 2 insurance license and life and disability coverages, which are reported under its Class B insurance license. The Bermuda Monetary Authority is responsible for monitoring compliance with solvency requirements and requires an Annual Financial Filing for this purpose.

Caterpillar Product Services Corporation (CPSC), a wholly owned subsidiary of Caterpillar, is a warranty company domiciled in Missouri. CPSC previously conducted a machine extended service contract program in Germany and France by providing machine extended warranty reimbursement protection to dealers in Germany and France. The program was discontinued effective January 1, 2013, though CPSC continues to provide extended warranty reimbursement protection under existing contracts.

Caterpillar Insurance Services Corporation, a wholly owned subsidiary of Caterpillar Insurance Holdings Inc., is a Tennessee insurance agency licensed in all 50 states, the District of Columbia and Guam. It provides brokerage and insurance services for all property and casualty and life and health lines of business.

Caterpillar's insurance group provides protection and service for claims under the following programs:

- Contractual Liability Insurance to insure certain service contract obligations of Caterpillar and its affiliates, Caterpillar dealers and original equipment manufacturers (OEMs).
- Cargo reinsurance for the worldwide cargo risks of Caterpillar products.

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- Contractors' Equipment Physical Damage Insurance for equipment manufactured by Caterpillar or OEMs, which is leased, rented or sold by third party dealers to customers.
- General liability, employer's liability, auto liability and property insurance for Caterpillar.
- Life, disability, medical and accident reinsurance for Caterpillar's international employee benefits program (non-U.S.).
- Reinsurance to cover VEBA Trust for medical claims of certain Caterpillar retirees and dependents.
- Brokerage and insurance services for property and casualty and life and health business.

Competitive Environment

Caterpillar products and services are sold worldwide into a variety of highly competitive markets. In all markets, we compete on the basis of product performance, customer service, quality and price. From time to time, the intensity of competition results in price discounting in a particular industry or region. Such price discounting puts pressure on margins and can negatively impact operating profit. Outside the United States, certain competitors enjoy competitive advantages inherent to operating in their home countries or regions.

Raw Materials and Component Products

We source our raw materials and manufactured components from suppliers both domestically and internationally. These purchases include unformed materials and rough and finished parts. Unformed materials include a variety of steel products, which are then cut or formed to shape and machined in our facilities. Rough parts include various sized steel and iron castings and forgings, which are machined to final specification levels inside our facilities. Finished parts are ready to assemble components, which are made either to Caterpillar specifications or to supplier developed specifications. We machine and assemble some of the components used in our machines, engines and power generation units and to support our after-market dealer parts sales. We also purchase various goods and services used in production, logistics, offices and product development processes. We maintain global strategic sourcing models to meet our global facilities' production needs while building long-term supplier relationships and leveraging enterprise spend. We expect our suppliers to maintain, at all times, industry-leading levels of quality and the ability to timely deliver raw materials and component products for our machine and engine products. However, in some cases, increases in demand or supply chain disruptions have led to parts and components constraints across some products. We use a variety of agreements with suppliers to protect our intellectual property and processes to monitor and mitigate risks of the supply base causing a business disruption. The risks monitored include supplier financial viability, the ability to increase or decrease production levels, business continuity, quality and delivery.

Patents and Trademarks

We own a number of patents and trademarks, which have been obtained over a period of years and relate to the products we manufacture and the services we provide. These patents and trademarks are generally considered beneficial to our business. We do not regard our business as being dependent upon any single patent or group of patents.

Order Backlog

The dollar amount of backlog believed to be firm was approximately \$30.4 billion at December 31, 2022 and \$23.1 billion at December 31, 2021. Compared with year-end 2021, the order backlog increased for both the Energy & Transportation and Construction Industries segments, with the largest increase in Energy & Transportation. Of the total backlog at December 31, 2022, approximately \$5.5 billion was not expected to be filled in 2023.

Dealers and Distributors

We distribute our machines principally through a worldwide organization of dealers (dealer network), 43 located in the United States and 113 located outside the United States, serving 192 countries. We sell reciprocating engines principally through the dealer network and to other manufacturers for use in products. We also sell some of the reciprocating engines manufactured by our subsidiary Perkins Engines Company Limited through its worldwide network of 88 distributors covering 185 countries. We sell the FG Wilson branded electric power generation systems through its worldwide network of 110 distributors covering 109 countries. We also sell some of the large, medium speed reciprocating engines under the MaK brand through a worldwide network of 20 distributors covering 130 countries.

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Our dealers do not deal exclusively with our products; however, in most cases sales and servicing of our products are the dealers' principal business. We sell some products, primarily turbines and locomotives, directly to end customers through sales forces employed by the company. At times, these employees are assisted by independent sales representatives.

While the large majority of our worldwide dealers are independently owned and operated, we own and operate a dealership in Japan that covers approximately 80% of the Japanese market: Nippon Caterpillar Division. We are currently operating this Japanese dealer directly and we report its results in the All Other operating segment. There are also three independent dealers in the Southern Region of Japan.

For Caterpillar branded products, the company's relationship with each of its independent dealers is memorialized in standard sales and service agreements. Pursuant to these agreements, the company grants the dealer the right to purchase and sell its products and to service the products in a specified geographic service territory. The company establishes prices to dealers after receiving input from dealers on transactional pricing in the marketplace. The company also agrees to defend its intellectual property and to provide warranty and technical support to the dealer. The agreement further grants the dealer a non-exclusive license to use the company's trademarks, service marks and brand names. In some instances, a separate trademark agreement exists between the company and a dealer.

In exchange for these rights, the agreement obligates the dealer to develop and promote the sale of the company's products to current and prospective customers in the dealer's service territory. Each dealer agrees to employ adequate sales and support personnel to market, sell and promote the company's products, demonstrate and exhibit the products, perform the company's product improvement programs, inform the company concerning any features that might affect the safe operation of any of the company's products and maintain detailed books and records of the dealer's financial condition, sales and inventories and make these books and records available at the company's reasonable request.

These sales and service agreements are terminable at will by either party primarily upon 90 days written notice.

Human Capital

Core Values

Caterpillar's global workforce is united by Our Values In Action, Caterpillar's Code of Conduct. Integrity, Excellence, Teamwork, Commitment and Sustainability provide the foundation for our values-based culture. Our diversity and inclusion principles are embedded in our values. Our values unite us, and reflect our diverse cultures, languages, geographies, and businesses, as one Caterpillar team.

Health and Safety

The health and safety of our employees is an important focus at Caterpillar, and we strive to continually reduce our recordable injuries. As part of this focus on health and safety, Caterpillar has established a peer-to-peer safety mentorship and education program for manufacturing new hires to accelerate acclimation to our safety culture in many global locations. In 2022, the Company achieved a recordable injury frequency rate of 0.44, compared to the 2021 recordable injury frequency rate of 0.41.

Talent Development and Training

In addition to our focus on values and safety, we strive to continually attract, develop, engage, and retain a high-performing diverse global team that executes our enterprise strategy of long-term profitable growth.

We are committed to employee development and helping individuals reach their full potential, by making on-going investments in our team. Our global internships, engineering co-ops, and career programs for engineering, marketing, and manufacturing provide development opportunities for early career employees. We also have a continual focus on strengthening technical, professional and leadership capabilities at every level. Strategic talent reviews and succession planning occur at a minimum, annually, across our businesses.

Our leadership development programs and focus on encouraging a variety of experiences to help employees broaden understanding and increase perspective. Our leadership curriculums include managing for inclusion as a core development principle and a professional skill.

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Additionally, skill-based programs to upskill our manufacturing employees are developed locally and tailored to the specific needs of the business. In China, we continue to invest in programs that encourage women to pursue engineering management and leadership roles. In India, we tailored recruiting campaigns and on-site benefits to attract female employees. Caterpillar, along with other companies across industries, participates in the OneTen coalition. The coalition is committed to upskill, hire and advance Black Americans over the next 10 years into family-sustaining careers.

Diversity and Inclusion

We are committed to fostering a diverse workforce and an inclusive environment. Our strategic approach weaves diversity and inclusion seamlessly into the business, ensuring that the principles guide us in our daily operating rhythm. Our 14 Employee Resource Groups (ERGs), which are sponsored and supported by leadership, help ensure different voices and perspectives contribute to our strategy for long-term profitable growth. They also engage our employees, helping contribute to development and retention.

Our ERGs provide many contributions, such as mentoring programs that connect diverse employees with senior leaders who can support their career goals, partnerships with recruiters and diverse early career and professional organizations that can assist in strengthening the diverse talent pipeline and programs that educate and inform on the richness of the global cultures that we share.

Compensation, Benefits and Employee Insights

Providing competitive benefits and compensation underpins our commitment to our engaged and productive employees. Our pay-for-performance philosophy aligns employee's individual contributions, behaviors and business results with individual rewards. Our comprehensive Total Health programs focus on purpose, as well as physical, emotional, financial, and social health. The annual Employee Insights Survey provides all employees the opportunity to confidentially share their perspectives and engages leaders to listen, learn and respond to employee feedback.

Employment

Management aligns employment levels with the needs of the business. We believe we have the appropriate human capital resources to successfully operate and deliver our enterprise strategy. As of December 31, 2022, we employed about 109,100 full-time persons of whom approximately 60,900 were located outside the United States. In the United States, we employed approximately 48,200 full-time persons, most of whom are at-will employees and, therefore, not subject to any type of employment contract or agreement. At select business units, we have hired certain highly specialized employees under employment contracts that specify a term of employment, pay and other benefits.

Full-Time Employees at Year-End

	2022	2021
Inside U.S.	48,200	44,300
Outside U.S.	60,900	63,400
Total	109,100	107,700

By Region:

North America	48,700	44,700
EAME	16,900	17,600
Latin America	19,100	19,500
Asia/Pacific	24,400	25,900
Total	109,100	107,700

As of December 31, 2022, there were approximately 7,980 hourly production employees in the United States who were covered by collective bargaining agreements with various labor unions, including The United Automobile, Aerospace and Agricultural Implement Workers of America (UAW), The International Association of Machinists and The United Steelworkers. Outside the United States, the company enters into employment contracts and agreements in those countries in which such relationships are mandatory or customary. The provisions of these agreements generally correspond in each case with the required or customary terms in the subject jurisdiction.

[Table of Contents](#)**Environmental Matters**

The company is regulated by federal, state and international environmental laws governing our use, transport and disposal of substances and control of emissions. In addition to governing our manufacturing and other operations, these laws often impact the development of our products, including, but not limited to, required compliance with air emissions standards applicable to internal combustion engines. We have made, and will continue to make, significant research and development and capital expenditures to comply with these emissions standards.

We are engaged in remedial activities at a number of locations, often with other companies, pursuant to federal and state laws. When it is probable we will pay remedial costs at a site, and those costs can be reasonably estimated, the investigation, remediation, and operating and maintenance costs of the remedial action are accrued against our earnings. Costs are accrued based on consideration of currently available data and information with respect to each individual site, including available technologies, current applicable laws and regulations, and prior remediation experience. Where no amount within a range of estimates is more likely, we accrue the minimum. Where multiple potentially responsible parties are involved, we consider our proportionate share of the probable costs. In formulating the estimate of probable costs, we do not consider amounts expected to be recovered from insurance companies or others. We reassess these accrued amounts on a quarterly basis. The amount recorded for environmental remediation is not material and is included in the line item "Accrued expenses" in Statement 3 — "Consolidated Financial Position at December 31" of Part II, Item 8 "Financial Statements and Supplementary Data." There is no more than a remote chance that a material amount for remedial activities at any individual site, or at all the sites in the aggregate, will be required.

Available Information

The company files electronically with the Securities and Exchange Commission (SEC) required reports on Form 8-K, Form 10-Q, Form 10-K and Form 11-K; proxy materials; ownership reports for insiders as required by Section 16 of the Securities Exchange Act of 1934 (Exchange Act); registration statements on Forms S-3 and S-8, as necessary; and other forms or reports as required. The SEC maintains a website (www.sec.gov) that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. The company maintains a website (www.Caterpillar.com) and copies of our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to these reports filed or furnished with the SEC are available free of charge through our website (www.Caterpillar.com/secfilings) as soon as reasonably practicable after filing with the SEC. Copies of our board committee charters, our board's Guidelines on Corporate Governance Issues, Worldwide Code of Conduct and other corporate governance information are available on our website (www.Caterpillar.com/governance). The information contained on the company's website is not included in, or incorporated by reference into, this annual report on Form 10-K.

Additional company information may be obtained as follows:

Current information -

- view additional financial information on-line at www.Caterpillar.com/en/investors/financial-information.html
- request, view or download materials on-line or register for email alerts at www.Caterpillar.com/materialsrequest

Historical information -

- view/download on-line at www.Caterpillar.com/historical

[Table of Contents](#)**Item 1A. Risk Factors.**

The statements in this section describe the most significant risks to our business and should be considered carefully in conjunction with Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and the “Notes to Consolidated Financial Statements” of Part II, Item 8 “Financial Statements and Supplementary Data” to this Form 10-K. In addition, the statements in this section and other sections of this Form 10-K, including in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” include “forward-looking statements” as that term is defined in the Private Securities Litigation Reform Act of 1995 and involve uncertainties that could significantly impact results. Forward-looking statements give current expectations or forecasts of future events about the company or our outlook. You can identify forward-looking statements by the fact they do not relate to historical or current facts and by the use of words such as “believe,” “expect,” “estimate,” “anticipate,” “will be,” “should,” “plan,” “forecast,” “target,” “guide,” “project,” “intend,” “could” and similar words or expressions.

Forward-looking statements are based on assumptions and on known risks and uncertainties. Although we believe we have been prudent in our assumptions, any or all of our forward-looking statements may prove to be inaccurate, and we can make no guarantees about our future performance. Should known or unknown risks or uncertainties materialize or underlying assumptions prove inaccurate, actual results could materially differ from past results and/or those anticipated, estimated or projected.

We undertake no obligation to publicly update forward-looking statements, whether as a result of new information, future events or otherwise. You should, however, consult any subsequent disclosures we make in our filings with the SEC on Form 10-Q or Form 8-K.

The following is a cautionary discussion of risks, uncertainties and assumptions that we believe are material to our business. In addition to the factors discussed elsewhere in this report, the following are some of the important factors that, individually or in the aggregate, we believe could make our actual results differ materially from those described in any forward-looking statements. It is impossible to predict or identify all such factors and, as a result, you should not consider the following factors to be a complete discussion of risks, uncertainties and assumptions.

MACROECONOMIC RISKS**Our business and the industries we serve are highly sensitive to global and regional economic conditions.**

Our results of operations are materially affected by economic conditions globally and regionally and in the particular industries we serve. The demand for our products and services tends to be cyclical and can be significantly reduced in periods of economic weakness characterized by lower levels of government and business investment, lower levels of business confidence, lower corporate earnings, high real interest rates, lower credit activity or tighter credit conditions, perceived or actual industry overcapacity, higher unemployment and lower consumer spending. A prolonged period of economic weakness may also result in increased expenses due to higher allowances for doubtful accounts and potential goodwill and asset impairment charges. Economic conditions vary across regions and countries, and demand for our products and services generally increases in those regions and countries experiencing economic growth and investment. Slower economic growth or a change in the global mix of regions and countries experiencing economic growth and investment could have an adverse effect on our business, results of operations and financial condition.

The energy, transportation, and mining industries are significant adopters of Caterpillar products. In these industries customers are likely to base their purchase decisions upon expected future commodity dynamics, including price. Commodity prices, especially in the post-COVID period, have experienced frequent volatility. Volatility in these markets may be abrupt and unpredictable in response to global economic conditions, government actions, regulatory changes, supply/demand dynamics, innovation, and commodity substitutions among others. Economic conditions affecting the industries we serve may reduce capital expenditures in response to a variety of the aforementioned conditions. Reduction in these capital expenditures may lead to decreased demand for Caterpillar products and services as well as aftermarket parts as customers may choose to extend preventative maintenance and delay overhauls when possible.

The rates of infrastructure spending, commercial construction and housing starts also play a significant role in our results. Our products are an integral component of these activities, and as these activities decrease, demand for our products and services may be significantly impacted, which could negatively impact our results.

[Table of Contents](#)**Catastrophic events, including global pandemics such as the COVID-19 pandemic, could materially adversely affect our business, results of operations and/or financial condition.**

The occurrence of a major earthquake, fire, flood, tsunami or other weather event, power loss, telecommunications failure, software or hardware malfunctions, pandemics (including the COVID-19 pandemic), cyber-attack, war, terrorist attack or other catastrophic event that our disaster recovery plans do not adequately address, could adversely affect our employees, our systems, our ability to produce and distribute our products, and our reputation. For example, the COVID-19 pandemic has had, and continues to have, a significant impact around the world, prompting governments and businesses to take unprecedented measures in response. Such measures have included travel bans and restrictions, quarantines, shelter in place orders and shutdowns. These measures have impacted and may continue to impact all or portions of our workforce and operations and the operations of our customers, dealers and suppliers. Although certain restrictions related to the COVID-19 pandemic have eased, uncertainty continues to exist regarding such measures and potential future measures. Current material and component shortages, logistics constraints and labor inefficiencies have limited and could continue to limit our ability to meet customer demand, which could have a material adverse effect on our business, results of operations and/or financial condition.

The COVID-19 pandemic has significantly increased economic and customer demand uncertainty, has caused inflationary pressure in the U.S. and elsewhere and has led to volatility in customer demand for the Company's products and services and caused supply chain disruptions. Economic uncertainties could continue to affect customer demand for the Company's products and services, the value of the equipment financed or leased, the demand for financing and the financial condition and credit risk of our dealers and customers.

A catastrophic event resulting in the destruction or disruption of our workforce, our systems, our ability to produce and distribute our products, any of our data centers or our critical business or information technology systems could adversely affect our ability to conduct normal business operations and our operating results or cash flows. The adverse effects of any such catastrophic event would be exacerbated if experienced at the same time as another unexpected and adverse event, such as the COVID-19 pandemic.

Commodity price changes, material price increases, fluctuations in demand for our products and services, significant disruptions to our supply chains or significant shortages of labor and material may adversely impact our financial results or our ability to meet commitments to customers.

We are a significant user of steel and many other commodities required for the manufacture of our products. Increases in the prices of such commodities would increase our costs, negatively impacting our business, results of operations and financial condition if we are unable to fully offset the effect of these increased costs through price increases, productivity improvements or cost reduction programs.

We rely on suppliers to produce or secure material required for the manufacture of our products. Production challenges at suppliers (including suppliers of semiconductors), a disruption in deliveries to or from suppliers or decreased availability of raw materials or commodities could have an adverse effect on our ability to meet our commitments to customers or increase our operating costs. On the other hand, in circumstances where demand for our products is less than we expect, we may experience excess inventories and be forced to incur additional costs and our profitability may suffer. Additionally, we have experienced and expect to continue to experience transportation delays for parts, components and finished machines due to capacity constraints and congestion at ports throughout the globe although the situation has improved compared to recent periods. Our business, competitive position, results of operations or financial condition could be negatively impacted if supply is insufficient for our operations, if significant transportation delays interfere with deliveries, if we experience excess inventories or if we are unable to adjust our production schedules or our purchases from suppliers to reflect changes in customer demand and market fluctuations on a timely basis.

Changes in government monetary or fiscal policies may negatively impact our results.

Most countries where our products and services are sold have established central banks to regulate monetary systems and influence economic activities, generally by adjusting interest rates. Interest rate changes affect overall economic growth, which affects demand for residential and nonresidential structures, as well as energy and mined products, which in turn affects sales of our products and services that support these activities. Interest rate changes may also affect our customers' ability to finance machine purchases, can change the optimal time to keep machines in a fleet and can impact the ability of our suppliers to finance the production of parts and components necessary to manufacture and support our products. Increases in interest rates could negatively impact sales and create supply chain inefficiencies.

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Central banks and other policy arms of many countries may take actions to vary the amount of liquidity and credit available in an economy. The impact from a change in liquidity and credit policies could negatively affect the customers and markets we serve or our suppliers, create supply chain inefficiencies and could adversely impact our business, results of operations and financial condition.

Changes in monetary and fiscal policies, along with other factors, may cause currency exchange rates to fluctuate. Actions that lead the currency exchange rate of a country where we manufacture products to increase relative to other currencies could reduce the competitiveness of products made in that country, which could adversely affect our competitive position, results of operations and financial condition.

Government policies on taxes and spending also affect our business. Throughout the world, government spending finances a significant portion of infrastructure development, such as highways, rail systems, airports, sewer and water systems, waterways and dams. Tax regulations determine asset depreciation lives and impact the after-tax returns on business activity and investment, both of which influence investment decisions. Unfavorable developments, such as decisions to reduce public spending or to increase taxes, could negatively impact our results.

Our global operations are exposed to political and economic risks, commercial instability and events beyond our control in the countries in which we operate.

Our global operations are dependent upon products manufactured, purchased and sold in the U.S. and internationally, including in countries with political and economic instability or uncertainty. Some countries have greater political and economic volatility and greater vulnerability to infrastructure and labor disruptions than others. Our business could be negatively impacted by adverse fluctuations in freight costs, fuel costs (e.g., diesel, bunker, jet), limitations on shipping and receiving capacity, and other disruptions in the transportation and shipping infrastructure at important geographic points of exit and entry for our products. Operating in different regions and countries exposes us to numerous risks, including:

- multiple and potentially conflicting laws, regulations and policies that are subject to change;
- imposition of currency restrictions, restrictions on repatriation of earnings or other restraints;
- imposition of new or additional tariffs or quotas;
- withdrawal from or modification of trade agreements or the negotiation of new trade agreements;
- imposition of new or additional trade and economic sanctions laws imposed by the U.S. or foreign governments;
- war or acts of terrorism; and
- political and economic instability or civil unrest that may severely disrupt economic activity in affected countries.

The occurrence of one or more of these events may negatively impact our business, results of operations and financial condition.

OPERATIONAL RISKS

The success of our business depends on our ability to develop, produce and market quality products that meet our customers' needs.

Our business relies on continued global demand for our brands and products. To achieve business goals, we must develop and sell products that appeal to our dealers, OEMs and end-user customers. This is dependent on a number of factors, including our ability to maintain key dealer relationships; 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. In addition, our continued success in selling products that appeal to our customers is dependent on leading-edge innovation, with respect to both products and operations, and on the availability and effectiveness of legal protection for our innovations. Failure to continue to deliver high quality, innovative, competitive products to the marketplace, to adequately protect our intellectual property rights; to supply products that meet applicable regulatory requirements, including engine exhaust emission requirements or to predict market demands for, or gain market acceptance of, our products, could have a negative impact on our business, results of operations and financial condition.

[Table of Contents](#)**We operate in a highly competitive environment, which could adversely affect our sales and pricing.**

We operate in a highly competitive environment. We compete on the basis of a variety of factors, including product performance, customer service, quality and price. There can be no assurance that our products will be able to compete successfully with other companies' products. Thus, our share of industry sales could be reduced due to aggressive pricing or product strategies pursued by competitors, unanticipated product or manufacturing difficulties, our failure to price our products competitively, our failure to produce our products at a competitive cost or an unexpected buildup in competitors' new machine or dealer-owned rental fleets, which could lead to downward pressure on machine rental rates and/or used equipment prices.

Lack of customer acceptance of price increases we announce from time to time, changes in customer requirements for price discounts, changes in our customers' behavior or a weak pricing environment could have an adverse impact on our business, results of operations and financial condition.

In addition, our results and ability to compete may be impacted negatively by changes in our geographic and product mix of sales.

Increased information technology security threats and more sophisticated computer crime pose a risk to our systems, networks, products and services.

We rely upon information technology systems and networks, some of which are managed by third parties, in connection with a variety of business activities. Additionally, we collect and store sensitive information relating to our business, customers, dealers, suppliers and employees. Operating these information technology systems and networks and processing and maintaining this data in a secure manner, is critical to our business operations and strategy. Information technology security threats -- from user error to cybersecurity attacks designed to gain unauthorized access to our systems, networks and data -- are increasing in frequency and sophistication. Cybersecurity attacks from threat actors globally range from random attempts to coordinated and targeted attacks, including sophisticated computer crime and advanced persistent threats. These threats pose a risk to the security of our systems and networks and the confidentiality, availability and integrity of our data. Cybersecurity attacks could also include attacks targeting customer data or the security, integrity and/or reliability of the hardware and software installed in our products. It is possible that our information technology systems and networks, or those managed or provided by third parties, could have vulnerabilities, which could go unnoticed for a period of time. While various procedures and controls have been and are being utilized to mitigate such risks, there can be no guarantee that the actions and controls we have implemented and are implementing, or which we cause or have caused third-party service providers to implement, will be sufficient to protect and mitigate associated risks to our systems, information or other property.

We have experienced cyber security threats and vulnerabilities in our systems and those of our third party providers, and we have experienced viruses and attacks targeting our information technology systems and networks. Such prior events, to date, have not had a material impact on our financial condition, results of operations or liquidity. However, the potential consequences of a future material cybersecurity attack include reputational damage, litigation with third parties, government enforcement actions, penalties, disruption to systems, unauthorized release of confidential or otherwise protected information, corruption of data, diminution in the value of our investment in research, development and engineering, and increased cybersecurity protection and remediation costs, which in turn could adversely affect our competitiveness, results of operations and financial condition. Due to the evolving nature of such security threats, the potential impact of any future incident cannot be predicted. Further, the amount of insurance coverage we maintain may be inadequate to cover claims or liabilities relating to a cybersecurity attack.

In addition, data we collect, store and process are subject to a variety of U.S. and international laws and regulations, such as the European Union's General Data Protection Regulation and the California Consumer Privacy Act, which may carry significant potential penalties for noncompliance.

[Table of Contents](#)**Our business is subject to the inventory management decisions and sourcing practices of our dealers and our OEM customers.**

We sell finished products primarily through an independent dealer network and directly to OEMs and are subject to risks relating to their inventory management decisions and operational and sourcing practices. Both carry inventories of finished products as part of ongoing operations and adjust those inventories based on their assessments of future needs and market conditions, including levels of used equipment inventory and machine rental usage rates. Such adjustments may impact our results positively or negatively. If the inventory levels of our dealers and OEM customers are higher than they desire, they may postpone product purchases from us, which could cause our sales to be lower than the end-user demand for our products and negatively impact our results. Similarly, our results could be negatively impacted through the loss of time-sensitive sales if our dealers and OEM customers do not maintain inventory levels sufficient to meet customer demand.

We may not realize all of the anticipated benefits of our acquisitions, joint ventures or divestitures, or these benefits may take longer to realize than expected.

In pursuing our business strategy, we routinely evaluate targets and enter into agreements regarding possible acquisitions, divestitures and joint ventures. We often compete with others for the same opportunities. To be successful, we conduct due diligence to identify valuation issues and potential loss contingencies, negotiate transaction terms, complete complex transactions and manage post-closing matters such as the integration of acquired businesses. Further, while we seek to mitigate risks and liabilities of such transactions through due diligence, among other things, there may be risks and liabilities that our due diligence efforts fail to discover, that are not accurately or completely disclosed to us or that we inadequately assess. We may incur unanticipated costs or expenses following a completed acquisition, including post-closing asset impairment charges, expenses associated with eliminating duplicate facilities, litigation, and other liabilities. Risks associated with our past or future acquisitions also include the following:

- the failure to achieve the acquisition's revenue or profit forecast;
- the business culture of the acquired business may not match well with our culture;
- technological and product synergies, economies of scale and cost reductions may not occur as expected;
- unforeseen expenses, delays or conditions may be imposed upon the acquisition, including due to required regulatory approvals or consents;
- we may acquire or assume unexpected liabilities or be subject to unexpected penalties or other enforcement actions;
- faulty assumptions may be made regarding the macroeconomic environment or the integration process;
- unforeseen difficulties may arise in integrating operations, processes and systems;
- higher than expected investments may be required to implement necessary compliance processes and related systems, including information technology systems, accounting systems and internal controls over financial reporting;
- we may fail to retain, motivate and integrate key management and other employees of the acquired business;
- higher than expected costs may arise due to unforeseen changes in tax, trade, environmental, labor, safety, payroll or pension policies in any jurisdiction in which the acquired business conducts its operations; and
- we may experience problems in retaining customers and integrating customer bases.

Many of these factors will be outside of our control and any one of them could result in increased costs, decreases in the amount of expected revenues and diversion of management's time and attention. They may also delay the realization of the benefits we anticipate when we enter into a transaction.

In order to conserve cash for operations, we may undertake acquisitions financed in part through public offerings or private placements of debt or equity securities, or other arrangements. Such acquisition financing could result in a decrease in our earnings and adversely affect other leverage measures. If we issue equity securities or equity-linked securities, the issued securities may have a dilutive effect on the interests of the holders of our common shares.

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Failure to implement our acquisition strategy, including successfully integrating acquired businesses, could have an adverse effect on our business, financial condition and results of operations. Furthermore, we make strategic divestitures from time to time. In the case of divestitures, we may agree to indemnify acquiring parties for certain liabilities arising from our former businesses. These divestitures may also result in continued financial involvement in the divested businesses following the transaction, including through guarantees or other financial arrangements. Lower performance by those divested businesses could affect our future financial results.

Union disputes or other labor matters could adversely affect our operations and financial results.

Some of our employees are represented by labor unions in a number of countries under various collective bargaining agreements with varying durations and expiration dates. There can be no assurance that any current or future issues with our employees will be resolved or that we will not encounter future strikes, work stoppages or other disputes with labor unions or our employees. We may not be able to satisfactorily renegotiate collective bargaining agreements in the United States and other countries when they expire. If we fail to renegotiate our existing collective bargaining agreements, we could encounter strikes or work stoppages or other disputes with labor unions. In addition, existing collective bargaining agreements may not prevent a strike or work stoppage at our facilities in the future. We may also be subject to general country strikes or work stoppages unrelated to our business or collective bargaining agreements. A work stoppage or other limitations on production at our facilities for any reason could have an adverse effect on our business, results of operations and financial condition. In addition, many of our customers and suppliers have unionized work forces. Strikes or work stoppages experienced by our customers or suppliers could have an adverse effect on our business, results of operations and financial condition.

Unexpected events may increase our cost of doing business or disrupt our operations.

The occurrence of one or more unexpected events, including war, acts of terrorism or violence, civil unrest, fires, tornadoes, tsunamis, hurricanes, earthquakes, floods and other forms of severe weather in the United States or in other countries in which we operate or in which our suppliers are located could adversely affect our operations and financial performance. Natural disasters, pandemic illness, such as COVID-19, equipment failures, power outages or other unexpected events could result in physical damage to and complete or partial closure of one or more of our manufacturing facilities or distribution centers, temporary or long-term disruption in the supply of component products from some local and international suppliers, and disruption and delay in the transport of our products to dealers, end-users and distribution centers. Existing insurance coverage may not provide protection for all of the costs that may arise from such events.

FINANCIAL RISKS**Disruptions or volatility in global financial markets could limit our sources of liquidity, or the liquidity of our customers, dealers and suppliers.**

Continuing to meet our cash requirements over the long-term requires substantial liquidity and access to varied sources of funds, including capital and credit markets. Global economic conditions may cause volatility and disruptions in the capital and credit markets. Market volatility, changes in counterparty credit risk, the impact of government intervention in financial markets and general economic conditions may also adversely impact our ability to access capital and credit markets to fund operating needs. Global or regional economic downturns could cause financial markets to decrease the availability of liquidity, credit and credit capacity for certain issuers, including certain customers, dealers and suppliers. An inability to access capital and credit markets may have an adverse effect on our business, results of operations, financial condition and competitive position. Furthermore, changes in global economic conditions, including material cost increases and decreases in economic activity in key markets we serve, and the success of plans to manage cost increases, inventory and other important elements of our business may significantly impact our ability to generate funds from operations.

In addition, demand for our products generally depends on customers' ability to pay for our products, which, in turn, depends on their access to funds. Changes in global economic conditions may result in customers experiencing increased difficulty in generating funds from operations. Capital and credit market volatility and uncertainty may cause financial institutions to revise their lending standards, resulting in customers' decreased access to capital. If capital and credit market volatility occurs, customers' liquidity may decline which, in turn, would reduce their ability to purchase our products.

[Table of Contents](#)**Failure to maintain our credit ratings could increase our cost of borrowing and could adversely affect our cost of funds, liquidity, competitive position and access to capital markets.**

Each of Caterpillar's and Cat Financial's costs of borrowing and their respective ability to access the capital markets are affected not only by market conditions but also by the short- and long-term credit ratings assigned to their respective debt by the major credit rating agencies. These ratings are based, in significant part, on each of Caterpillar's and Cat Financial's performance as measured by financial metrics such as net worth, interest coverage and leverage ratios, as well as transparency with rating agencies and timeliness of financial reporting. There can be no assurance that Caterpillar and Cat Financial will be able to maintain their credit ratings. We receive debt ratings from the major credit rating agencies. A downgrade of our credit rating by any of the major credit rating agencies could result in increased borrowing costs and could adversely affect Caterpillar's and Cat Financial's liquidity, competitive position and access to the capital markets, including restricting, in whole or in part, access to the commercial paper market. There can be no assurance that the commercial paper market will continue to be a reliable source of short-term financing for Cat Financial or an available source of short-term financing for Caterpillar. An inability to access the capital markets could have an adverse effect on our cash flow, results of operations and financial condition.

Our Financial Products segment is subject to risks associated with the financial services industry.

Cat Financial is significant to our operations and provides financing support for a significant share of our global sales. The inability of Cat Financial to access funds to support its financing activities to our customers could have an adverse effect on our business, results of operations and financial condition.

Continuing to meet Cat Financial's cash requirements over the long-term could require substantial liquidity and access to sources of funds, including capital and credit markets. Cat Financial has continued to maintain access to key global medium-term note and commercial paper markets, but there can be no assurance that such markets will continue to represent a reliable source of financing. If global economic conditions were to deteriorate, Cat Financial could face materially higher financing costs, become unable to access adequate funding to operate and grow its business and/or meet its debt service obligations as they mature. Cat Financial also could be required to draw upon contractually committed lending agreements and/or seek other funding sources. However, there can be no assurance that such agreements and other funding sources would be sufficient or even available under extreme market conditions. Any of these events could negatively impact Cat Financial's business, as well as our and Cat Financial's results of operations and financial condition.

Market disruption and volatility may also lead to numerous risks in connection with these events, including but not limited to:

- Market developments that may affect customer confidence levels and cause declines in the demand for financing and adverse changes in payment patterns, causing increases in delinquencies and default rates, which could increase Cat Financial's write-offs and provision for credit losses.
- The process Cat Financial uses to estimate losses inherent in its credit exposure requires a high degree of management's judgment regarding numerous subjective qualitative factors, including forecasts of economic conditions and how economic predictors might impair the ability of its borrowers to repay their loans. Financial market disruption and volatility may impact the accuracy of these judgments.
- Cat Financial's ability to engage in routine funding transactions or to borrow from other financial institutions on acceptable terms or at all could be adversely affected by disruptions in the capital markets or other events, including actions by rating agencies and deteriorating investor expectations.
- As Cat Financial's borrowing agreements are primarily with financial institutions, their ability to perform in accordance with any of our underlying agreements could be adversely affected by market volatility and/or disruptions in financial markets.

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Changes in interest rates or market liquidity conditions could adversely affect Cat Financial's and our earnings and/or cash flow.

Changes in interest rates and market liquidity conditions could have an adverse impact on Cat Financial's and our earnings and cash flows. While interest rates had remained at historically low levels in recent years, the Federal Reserve Board significantly increased the federal funds rate in 2022 and has indicated that it expects continued increases in interest rates in 2023 and 2024 to combat rising inflation in the U.S. Because a significant number of the loans made by Cat Financial are made utilizing fixed interest rates, its business results are subject to fluctuations in interest rates. Certain loans made by Cat Financial and various financing extended to Cat Financial are made at variable rates that use LIBOR as a benchmark for establishing the interest rate.

LIBOR is the subject of recent proposals for reform. On July 27, 2017, the United Kingdom's Financial Conduct Authority ("FCA") announced that it intends to stop persuading or compelling banks to submit LIBOR rates after 2021. Immediately following the LIBOR publication on December 31, 2021, ICE Benchmark Administration ("IBA") ceased the publication of all GBP, EUR, CHF and JPY LIBOR settings, as well as the one-week and two-month USD LIBOR tenors. On November 30, 2020, IBA, with the support of the United States Federal Reserve and the FCA, announced plans to consult on ceasing publication of all other remaining USD LIBOR tenors on June 30, 2023. While the November 30 announcement extended the transition period to June 2023, the United States Federal Reserve concurrently issued a statement advising banks to stop new USD LIBOR issuances by the end of 2021. Further, on March 15, 2022, the Consolidated Appropriations Act of 2022, which includes the Adjustable Interest Rate (LIBOR) Act, was signed into law in the U.S. This legislation establishes a uniform benchmark replacement process for financial contracts maturing after June 30, 2023 that do not contain clearly defined or practicable fallback provisions. The legislation also creates a safe harbor that shields lenders from litigation if they choose to utilize a replacement rate recommended by the Federal Reserve. The Alternative Reference Rate Committee, a committee convened by the Federal Reserve that includes major market participants, has identified the Secured Overnight Financing Rate, or SOFR, a new index calculated by short-term repurchase agreements, backed by Treasury securities, as its preferred alternative rate for LIBOR. At this time, it is not possible to predict how markets will respond to SOFR or other alternative reference rates as the transition away from the LIBOR benchmarks is anticipated in coming years. There continue to be uncertainties regarding the transition from LIBOR, including but not limited to the need to renegotiate certain terms of our loan agreements with LIBOR as the referenced rate, which could require us to incur significant expense and may subject us to disputes or litigation over the appropriateness or comparability to LIBOR of the replacement reference rates.

The consequences of these developments cannot be entirely predicted and could have an adverse impact on the market value for or value of LIBOR-linked securities, loans, derivatives, and other financial obligations or extensions of credit held by or due to Cat Financial, as well as the revenue and expenses associated with those securities, loans and financial instruments. Cat Financial created a cross-functional team that assesses risk across multiple categories as it relates to the use of LIBOR in securities, loans, derivatives, and other financial obligations or extensions of credit held by or due to us. Other changes in market interest rates may influence Cat Financial's borrowing costs and could reduce its and our earnings and cash flows, returns on financial investments and the valuation of derivative contracts. Cat Financial manages interest rate and market liquidity risks through a variety of techniques that include a match funding strategy, the selective use of derivatives and a broadly diversified funding program. There can be no assurance, however, that fluctuations in interest rates and market liquidity conditions will not have an adverse impact on its and our earnings and cash flows. If any of the variety of instruments and strategies Cat Financial uses to hedge its exposure to these types of risk is ineffective, this may have an adverse impact on our earnings and cash flows. With respect to Insurance Services' investment activities, changes in the equity and bond markets could result in a decline in value of its investment portfolio, resulting in an unfavorable impact to earnings.

An increase in delinquencies, repossessions or net losses of Cat Financial customers could adversely affect its results.

Inherent in the operation of Cat Financial is the credit risk associated with its customers. The creditworthiness of each customer and the rate of delinquencies, repossessions and net losses on customer obligations are directly impacted by several factors, including relevant industry and economic conditions, the availability of capital, the experience and expertise of the customer's management team, commodity prices, political events and the sustained value of the underlying collateral. Any increase in delinquencies, repossessions and net losses on customer obligations could have a material adverse effect on Cat Financial's and our earnings and cash flows. Cat Financial evaluates and adjusts its allowance for credit losses related to past due and non-performing receivables on a regular basis. However, adverse economic conditions or other factors that might cause deterioration of the financial health of its customers could change the timing and level of payments received and necessitate an increase in Cat Financial's estimated losses, which could also have a material adverse effect on Cat Financial's and our earnings and cash flows.

[Table of Contents](#)**Currency exchange rate fluctuations affect our results of operations.**

We conduct operations in many countries involving transactions denominated in a variety of currencies. We are subject to currency-exchange rate risk to the extent that our costs are denominated in currencies other than those in which we earn revenues. Fluctuations in currency exchange rates have had, and will continue to have, an impact on our results as expressed in U.S. dollars. There can be no assurance that currency exchange rate fluctuations will not adversely affect our results of operations, financial condition and cash flows. While the use of currency hedging instruments may provide us with protection from adverse fluctuations in currency exchange rates, by utilizing these instruments we potentially forego the benefits that might result from favorable fluctuations in currency exchange rates. In addition, our outlooks do not assume fluctuations in currency exchange rates. Adverse fluctuations in currency exchange rates from the date of our outlooks could cause our actual results to differ materially from those anticipated in any outlooks and adversely impact our business, results of operations and financial condition.

We also face risks arising from the imposition of exchange controls and currency devaluations. Exchange controls may limit our ability to convert foreign currencies into U.S. dollars or to remit dividends and other payments by our foreign subsidiaries or businesses located in or conducted within a country imposing controls. Currency devaluations result in a diminished value of funds denominated in the currency of the country instituting the devaluation.

Restrictive covenants in our debt agreements could limit our financial and operating flexibility.

We maintain a number of credit facilities to support general corporate purposes (facilities) and have issued debt securities to manage liquidity and fund operations (debt securities). The agreements relating to a number of the facilities and the debt securities contain certain restrictive covenants applicable to us and certain subsidiaries, including Cat Financial. These covenants include maintaining a minimum consolidated net worth (defined as the consolidated shareholder's equity including preferred stock but excluding the pension and other post-retirement benefits balance within accumulated other comprehensive income (loss)), limitations on the incurrence of liens and certain restrictions on consolidation and merger. Cat Financial has also agreed under certain of these agreements not to exceed a certain leverage ratio (consolidated debt to consolidated net worth, calculated (1) on a monthly basis as the average of the leverage ratios determined on the last day of each of the six preceding calendar months and (2) at each December 31), to maintain a minimum interest coverage ratio (profit excluding income taxes, interest expense and net gain/(loss) from interest rate derivatives to interest expense, calculated at the end of each calendar quarter for the rolling four quarter period then most recently ended) and not to terminate, amend or modify its support agreement with us.

A breach of one or more of the covenants could result in adverse consequences that could negatively impact our business, results of operations and financial condition. These consequences may include the acceleration of amounts outstanding under certain of the facilities, triggering of an obligation to redeem certain debt securities, termination of existing unused commitments by our lenders, refusal by our lenders to extend further credit under one or more of the facilities or to enter into new facilities or the lowering or modification of our credit ratings or those of one or more of our subsidiaries.

Sustained increases in funding obligations under our pension plans may impair our liquidity or financial condition.

We maintain certain defined benefit pension plans for our employees, which impose on us certain funding obligations. We use many assumptions in determining our future payment obligations under the plans. Significant adverse changes in credit or capital markets could result in actual rates of return on pension investments being materially lower than projected and result in increased contribution requirements. We may be required to make material contributions to our pension plans in the future and may fund contributions through the use of cash on hand, the proceeds of borrowings, shares of our common stock or a combination of the foregoing, as permitted by applicable law. These factors could significantly increase our payment obligations under the plans, and as a result, adversely affect our business and overall financial condition.

[Table of Contents](#)**LEGAL & REGULATORY RISKS****Our global operations are subject to a wide-range of trade and anti-corruption laws and regulations.**

Due to the international scope of our operations, we are subject to a complex system of import- and export-related laws and regulations. These include U.S. regulations issued by Customs and Border Protection, the Bureau of Industry and Security, the Office of Antiboycott Compliance, the Directorate of Defense Trade Controls and the Office of Foreign Assets Control, as well as the counterparts of these agencies in other countries. Any alleged or actual violations may subject us to increased government scrutiny, investigation and civil and criminal penalties, and may limit our ability to import or export our products or to provide services outside the United States. Furthermore, embargoes and sanctions imposed by the U.S. and other governments restricting or prohibiting sales to specific persons or countries or based on product classification may expose us to potential criminal and civil sanctions. We cannot predict the nature, scope or effect of future regulatory requirements to which our operations might be subject. We also cannot predict in certain locations the manner in which existing laws might be administered or interpreted.

In addition, the U.S. Foreign Corrupt Practices Act and similar foreign anti-corruption laws generally prohibit companies and their intermediaries from making improper payments or providing anything of value to improperly influence foreign government officials for the purpose of obtaining or retaining business or obtaining an unfair advantage. Recent years have seen a substantial increase in the global enforcement of anti-corruption laws. Our operations outside the United States, including in developing countries, expose us to the risk of such violations. Violations of anti-corruption laws or regulations by our employees, intermediaries acting on our behalf, or our joint venture partners may result in severe criminal or civil sanctions. Violations may also disrupt our business, and may result in an adverse effect on our reputation, business and results of operations or financial condition.

International trade policies may impact demand for our products and our competitive position.

Government policies on international trade and investment such as import quotas, capital controls or tariffs, whether adopted by individual governments or addressed by regional trade blocs, can affect the demand for our products and services, impact the competitive position of our products or prevent us from being able to sell products in certain countries. The implementation of more restrictive trade policies (such as more detailed inspections, higher tariffs or new barriers to entry) in countries where we sell large quantities of products and services could negatively impact our business, results of operations and financial condition. For example, a government's adoption of "buy national" policies or retaliation by another government against such policies could have a negative impact on our results of operations.

We may incur additional tax expense or become subject to additional tax exposure.

We are subject to income taxes in the United States and numerous other jurisdictions. Our future results of operations could be adversely affected by changes in the effective tax rate as a result of a change in the mix of earnings between U.S. and non-U.S. jurisdictions or among jurisdictions with differing statutory tax rates. In addition, our future results of operations could also be adversely affected by changes in our overall profitability, changes in tax laws or treaties or in their application or interpretation, changes in tax rates, changes in generally accepted accounting principles, changes in the valuation of deferred tax assets and liabilities, changes in the amount of earnings indefinitely reinvested in certain non-U.S. jurisdictions, the results of audits and examinations of previously filed tax returns and continuing assessments of our tax exposures. We are also subject to the continuous examination of our income tax returns by the U.S. Internal Revenue Service and other tax authorities. We regularly assess the likelihood of an adverse outcome resulting from these examinations. If our effective tax rates were to increase, or if the ultimate determination of our taxes owed is for an amount in excess of amounts previously accrued, our operating results, cash flows and financial condition could be adversely affected. For information regarding additional legal matters related to our taxes, please see Note 6 — "Income taxes" and Note 22 — "Environmental and legal matters" of Part II, Item 8 "Financial Statements and Supplementary Data" to this Annual Report on Form 10-K.

[Table of Contents](#)**Costs associated with lawsuits or investigations or adverse rulings in enforcement or other legal proceedings may have an adverse effect on our results of operations.**

We are subject to a variety of legal proceedings and legal compliance risks in virtually every part of the world. We face risk of exposure to various types of claims, lawsuits and government investigations. We are involved in various claims and lawsuits related to product design, manufacture and performance liability (including claimed asbestos exposure), contracts, employment issues, environmental matters, intellectual property rights, tax, securities and other legal proceedings that arise in and outside of the ordinary course of our business. The industries in which we operate are also periodically reviewed or investigated by regulators, which could lead to enforcement actions, fines and penalties or the assertion of private litigation claims. It is not possible to predict with certainty the outcome of claims, investigations and lawsuits, and we could in the future incur judgments, fines or penalties or enter into settlements of lawsuits and claims that could have an adverse effect on our reputation, business, results of operations or financial condition in any particular period.

The global and diverse nature of our operations means that legal and compliance risks will continue to exist and additional legal proceedings and other contingencies, the outcome of which cannot be predicted with certainty, may arise from time to time. In addition, subsequent developments in legal proceedings may affect our assessment and estimates of loss contingencies recorded as a reserve and require us to make payments in excess of our reserves. Such payments could have an adverse effect on our reputation, business and results of operations or financial condition.

New regulations or changes in financial services regulation could adversely impact Caterpillar and Cat Financial.

Cat Financial's operations are highly regulated by governmental authorities in the locations where it operates, which can impose significant additional costs and/or restrictions on its business. In the United States, for example, certain Cat Financial activities are subject to the U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank), which includes extensive provisions regulating the financial services industry. As a result, Cat Financial has become and could continue to become subject to additional regulatory costs that could be significant and have an adverse effect on Cat Financial's and our results of operations and financial condition. Changes in regulations or additional regulations in the United States or internationally impacting the financial services industry could also add significant cost or operational constraints that might have an adverse effect on Cat Financial's and our results of operations and financial condition.

We are subject to stringent environmental laws and regulations that impose significant compliance costs.

Our facilities, operations and products are subject to increasingly stringent environmental laws and regulations globally, including laws and regulations governing emissions to noise, air, releases to soil and discharges to water and the generation, handling, storage, transportation, treatment and disposal of non-hazardous and hazardous waste materials. Some environmental laws impose strict, retroactive and joint and several liability for the remediation of the release of hazardous substances, even for conduct that was lawful at the time it occurred, or for the conduct of, or conditions caused by, prior operators, predecessors or other third parties. Failure to comply with environmental laws could expose us to penalties or clean-up costs, civil or criminal liability and sanctions on certain of our activities, as well as damage to property or natural resources. The potential liabilities, sanctions, damages and remediation efforts related to any non-compliance with such laws and regulations could negatively impact our ability to conduct our operations and our financial condition and results of operations. In addition, there can be no assurances that we will not be adversely affected by costs, liabilities or claims with respect to existing or subsequently acquired operations or under present laws and regulations or those that may be adopted or imposed in the future.

Environmental laws and regulations may change from time to time, as may related interpretations and other guidance. Changes in environmental laws or regulations could result in higher expenses and payments. Uncertainty relating to environmental laws or regulations may also affect how we conduct our operations and structure our investments and could limit our ability to enforce our rights. Changes in environmental and climate change laws or regulations, including laws relating to greenhouse gas emissions, could lead to new or additional investment in product designs and could increase environmental compliance expenditures. Changes in climate change concerns, or in the regulation of such concerns, including greenhouse gas emissions, could subject us to additional costs and restrictions, including increased energy and raw materials costs. If environmental laws or regulations are either changed or adopted and impose significant operational restrictions and compliance requirements upon us or our products, they could negatively impact our reputation, business, capital expenditures, results of operations, financial condition and competitive position.

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The Company's amended and restated bylaws provide that the Court of Chancery of the State of Delaware will be the exclusive forum for certain legal actions between the Company and its shareholders, which could discourage claims or limit the ability of the Company's shareholders to bring a claim in a judicial forum viewed by the shareholders as more favorable for disputes with the Company or the Company's directors, officers or other employees.

The Company's amended and restated bylaws provide to the fullest extent permitted by law that unless the Company consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Company, (ii) any action asserting a claim of breach of fiduciary duty owed by any director, officer or other employee of the Company to the Company or the Company's shareholders, (iii) any action asserting a claim against the Company or any director or officer or other employee of the Company arising pursuant to any provision of the Delaware General Corporation Law or the Company's certificate of incorporation or bylaws (as either may be amended from time to time) or (iv) any action asserting a claim against the Company or any director or officer or other employee of the Company governed by the internal affairs doctrine.

The exclusive forum provisions in our bylaws could limit our shareholders' ability to bring a claim in a judicial forum that it finds favorable for disputes with the Company or its directors, officers or other employees. Alternatively, if a court were to find the choice of forum provision contained in the Company's amended and restated bylaws to be inapplicable or unenforceable in an action, the Company may incur additional costs associated with resolving such action in other jurisdictions. The exclusive forum provision in the Company's amended and restated bylaws will not preclude or contract the scope of exclusive federal or concurrent jurisdiction for actions brought under the federal securities laws including the Securities Exchange Act of 1934, as amended, or the Securities Act of 1933, as amended, or the respective rules and regulations promulgated thereunder.

Item 1B. Unresolved Staff Comments.

None.

[Table of Contents](#)**Item 1C. Executive Officers of the Registrant.**

Name and age	Present Caterpillar Inc. position and date of initial election	Principal positions held during the past five years if other than Caterpillar Inc. position currently held
D. James Umpleby III (64)	Chairman of the Board (2018) and Chief Executive Officer (2017)	Group President (2013-2016)
Andrew R.J. Bonfield (60)	Chief Financial Officer (2018)	Group Chief Financial Officer for a multinational electricity and gas utility company (2010-2018)
Bob De Lange (53)	Group President (2017)	Vice President (2015-2016), Worldwide Product Manager, Medium Wheel Loaders, (2013-2014)
Denise C. Johnson (56)	Group President (2016)	Vice President (2012-2016)
Joseph E. Creed (47)	Group President (2021)	Vice President, Oil & Gas and Marine Division (2019-2020), Interim Chief Financial Officer (2018), Vice President, Finance Services Division (2017), Group Chief Financial Officer, Energy and Transportation (2013-2016)
Anthony D. Fassino (52)	Group President (2021)	Vice President, Building Construction Products (2018-2020), Director of Worldwide Forestry Products (2016-2018)
Suzette M. Long (57)	Chief Legal Officer and General Counsel (2017)	Interim Executive Vice President, Law and Public Policy (2017), Deputy General Counsel (2013-2017)
Cheryl H. Johnson (62)	Chief Human Resources Officer (2017)	Executive Vice President of Human Resources for a global multi-industry aerospace, defense and industrial manufacturing company (2012-2017)
William E. Schaupp (51)	Vice President and Chief Accounting Officer (2022)	Finance Director, Global Finance Services Division (2021-2022), Vice President and Controller and Chief Accounting Officer of PPG Industries, Inc. (2018-2021), Assistant Controller and Acting Controller for PPG Industries, Inc. (2018), Director Corporate Audit Services for PPG Industries, Inc. (2017-2018)

Item 2. Properties.**General Information**

Caterpillar's operations are highly integrated. Although the majority of our plants are involved primarily in production relating to our Construction Industries, Resource Industries or Energy & Transportation segments, several plants are involved in manufacturing relating to more than one business segment. In addition, several plants reported in our financial statements under the All Other segment are involved in the manufacturing of components that are used in the assembly of products for more than one business segment. Caterpillar's parts distribution centers are involved in the storage and distribution of parts for Construction Industries, Resource Industries and Energy & Transportation. The research and development activities carried on at our Technical Centers in Aurora and Mossville, Illinois involve products for Construction Industries, Resource Industries and Energy & Transportation.

We believe the properties we own to be generally well maintained and adequate for present use. Through planned capital expenditures, we expect these properties to remain adequate for future needs. Properties we lease are covered by leases expiring over terms of generally one to ten years. We do not anticipate any difficulty in retaining occupancy of any leased facilities, either by renewing leases prior to expiration or by replacing them with equivalent leased facilities.

[Table of Contents](#)**Headquarters and Other Key Offices**

Our corporate headquarters is in a leased office located in Irving, Texas. Our Financial Products business is headquartered in offices in Nashville, Tennessee. Additional key offices are located inside and outside the United States.

Technical Center, Training Centers, Demonstration Areas and Proving Grounds

We operate Technical Centers located in Aurora and Mossville, Illinois; Wuxi, China; and Chennai, India. Our demonstration centers are located in Tinaja Hills, Arizona; Edwards, Illinois; Chichibu, Japan and Malaga, Spain. We have various other technical and training centers, demonstration areas and proving grounds located both inside and outside the United States.

Parts Distribution Centers

Distribution of our parts is conducted from parts distribution centers inside and outside the United States. We operate parts distribution centers in the following locations: Arvin, California; Denver, Colorado; Miami, Florida; Atlanta, Georgia; Morton, Illinois; St. Paul, Minnesota; Clayton, Ohio; York, Pennsylvania; Waco, Texas; Spokane, Washington; Melbourne, Australia; Queensland, Australia; Grimbergen, Belgium; Piracicaba, Brazil; Shanghai, China; Sagami, Japan; San Luis Potosi, Mexico; Singapore, Republic of Singapore; Moscow, Russia; Johannesburg, South Africa; and Dubai, United Arab Emirates. We also own or lease other facilities that support our distribution activities.

Remanufacturing and Components

Remanufacturing of our products is reported in our Energy & Transportation segment and is conducted primarily at the facilities in the following locations: Franklin, Indiana; Bogor, Indonesia; Corinth, Mississippi; Prentiss County, Mississippi; West Fargo, North Dakota; Piracicaba, Brazil; Shanghai, China; and Nuevo Laredo, Mexico.

Component manufacturing is reported in the All Other segment and is conducted primarily at facilities in the following locations: East Peoria, Illinois; Mapleton, Illinois; Peoria, Illinois; Bogor, Indonesia; Menominee, Michigan; Boonville, Missouri; West Plains, Missouri; Goldsboro, North Carolina; Sumter, South Carolina; Tianjin, China; Xuzhou, China; Atessa, Italy; Bazzano, Italy; Frosinone, Italy; San Eusebio, Italy; Ramos Arizpe, Mexico; Pyeongtaek, South Korea; and Skinningrove, United Kingdom.

We also lease or own other facilities that support our remanufacturing and component manufacturing activities.

Manufacturing

Manufacturing of products for our Construction Industries, Resource Industries and Energy & Transportation segments is conducted primarily at the locations listed below. These facilities are believed to be suitable for their intended purposes, with adequate capacities for current and projected needs for existing products.

Our principal manufacturing facilities include those used by the following segments in the following locations:

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Segment	U.S. Facilities	Facilities Outside the U.S.
Construction Industries	Arkansas: North Little Rock Georgia: Athens Illinois: Decatur, East Peoria Kansas: Wamego Minnesota: Brooklyn Park North Carolina: Clayton, Sanford Texas: Victoria	Brazil: Campo Largo, Piracicaba China: Suzhou, Wujiang, Xuzhou, Qingzhou France: Grenoble, Echirolles Hungary: Godollo India: Hosur, Thiruvallur Italy: Minerbio, Cattolica Japan: Akashi Mexico: Torreon Netherlands: Den Bosch Poland: Janow, Sosnowiec Russia: Tosno Thailand: Rayong United Kingdom: Desford, Stockton
Resource Industries	Illinois: Decatur, East Peoria South Carolina: Sumter Texas: Denison Wisconsin: South Milwaukee	China: Qingzhou, Wuxi Germany: Dortmund, Lunen India: Thiruvallur Indonesia: Batam Italy: Jesi Mexico: Acuna, Monterrey, Reynosa Russia: Tosno Thailand: Rayong United Kingdom: Peterlee
Energy & Transportation	Alabama: Albertville, Montgomery California: San Diego Georgia: Griffin, Patterson Illinois: East Peoria, Mossville, Mapleton, Pontiac Indiana: Lafayette, Muncie Kentucky: Decoursey, Mayfield Oklahoma: Broken Arrow North Carolina: Winston-Salem Texas: Channelview, DeSoto, Fort Worth, Mabank, San Antonio, Schertz, Seguin, Sherman	Australia: Cardiff, Perth, Redbank, Revesby Brazil: Curitiba, Hortolandia, Piracicaba, Sete Lagoas China: Tianjin, Wuxi Czech Republic: Zatec, Zebrak Germany: Kiel, Mannheim, Rostock India: Aurangabad, Hosur Italy: Pistoria Mexico: San Luis Potosi, Tijuana United Kingdom: Larne, Peterborough, Sandiacre, South Queensferry, Springvale, Stafford, Wimborne

[Table of Contents](#)**Item 3. Legal Proceedings.**

Certain legal proceedings in which we are involved are discussed in Note 22 — "Environmental and legal matters" of Part II, Item 8 "Financial Statements and Supplementary Data" and should be considered an integral part of Part I, Item 3 "Legal Proceedings", which is hereby incorporated by reference.

Item 4. Mine Safety Disclosures.

Not applicable.

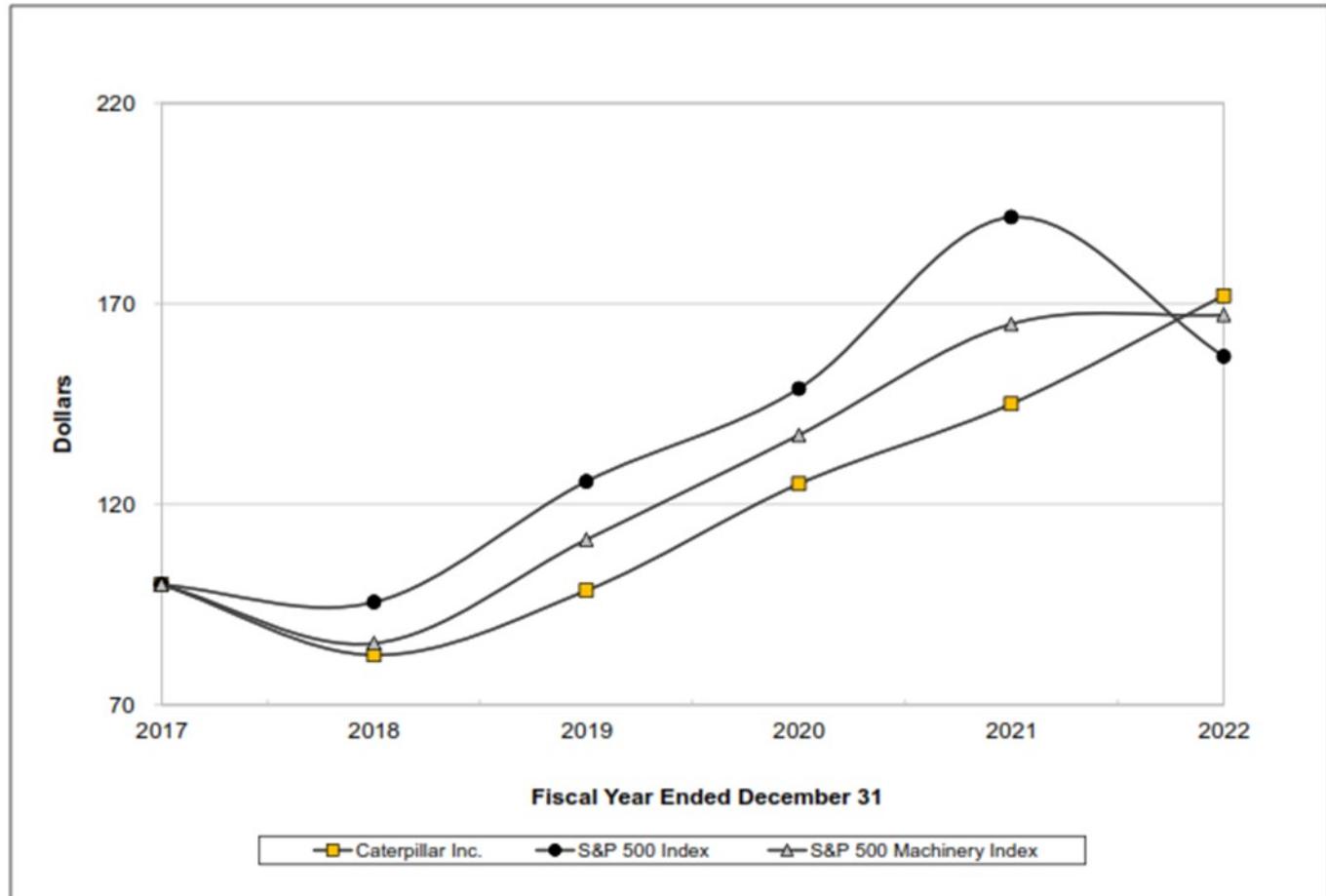
PART II**Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.****Common Stock (NYSE: CAT)**

Listing Information: Caterpillar common stock is listed on the New York Stock Exchange in the United States, and on stock exchanges in France and Switzerland.

Number of Shareholders: Shareholders of record at the end of 2022 totaled 21,935, compared with 22,559 at the end of 2021.

[Table of Contents](#)**Performance Graph: Total Cumulative Shareholder Return for Five-Year Period Ending December 31, 2022**

The graph below shows the cumulative shareholder return assuming an investment of \$100 on December 31, 2017, and reinvestment of dividends issued thereafter.



	2017	2018	2019	2020	2021	2022
Caterpillar Inc.	\$ 100.00	\$ 82.44	\$ 98.53	\$ 125.10	\$ 145.06	\$ 172.04
S&P 500	\$ 100.00	\$ 95.62	\$ 125.72	\$ 148.85	\$ 191.58	\$ 156.88
S&P 500 Machinery Index	\$ 100.00	\$ 85.36	\$ 111.22	\$ 137.27	\$ 164.94	\$ 167.25

[Table of Contents](#)**Non-U.S. Employee Stock Purchase Plans**

As of December 31, 2022, we had 28 employee stock purchase plans (the “EIP Plans”) administered outside the United States for our non-U.S. employees, which had approximately 13,000 active participants in the aggregate. During the fourth quarter of 2022, approximately 71,000 shares of Caterpillar common stock were purchased by the EIP Plans pursuant to the terms of such plans.

Issuer Purchases of Equity Securities

Period	Total Number of Shares Purchased ²	Average Price Paid per Share ²	Total Number of Shares Purchased as Part of Publicly Announced Program	Approximate Dollar Value of Shares that May Yet be Purchased under the Program (in billions) ¹
October 1-31, 2022	3,944,442	\$ 178.91	3,944,442	\$ 13.014
November 1-30, 2022	482,300	\$ 228.01	482,300	\$ 12.904
December 1-31, 2022	448,257	\$ 234.23	448,257	\$ 12.799
Total	4,874,999	\$ 188.85	4,874,999	

¹ In May 2022, the Board approved a new share repurchase authorization (the 2022 Authorization) of up to \$15.0 billion of Caterpillar common stock effective August 1, 2022, with no expiration. As of December 31, 2022, approximately \$12.8 billion remained available under the 2022 Authorization.

² In October, November and December of 2022, we repurchased 3.9 million, 0.5 million and 0.5 million shares respectively, for an aggregate of \$921 million in open market transactions at an average price per share of \$178.91, \$228.01 and \$234.23, respectively.

Item 6. [Reserved]

[Table of Contents](#)**Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.**

The following Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A) is intended to provide information that will assist the reader in understanding the company's Consolidated Financial Statements, the changes in certain key items in those financial statements between select periods and the primary factors that accounted for those changes. In addition, we discuss how certain accounting principles, policies and critical estimates affect our Consolidated Financial Statements. Our discussion also contains certain forward-looking statements related to future events and expectations. This MD&A should be read in conjunction with our discussion of cautionary statements and significant risks to the company's business under Item 1A. Risk Factors of the 2022 Form 10-K.

Highlights for the full-year 2022 include:

- Sales and revenues for 2022 were \$59.427 billion, an increase of \$8.456 billion, or 17 percent, compared with \$50.971 billion for 2021. Sales were higher across the three primary segments.
- Operating profit as a percent of sales and revenues was 13.3 percent in 2022, compared with 13.5 percent in 2021. ***Adjusted operating profit margin*** was 15.4 percent in 2022, compared with 13.7 percent in 2021.
- Profit per share for 2022 was \$12.64, and excluding the items in the table below, ***adjusted profit per share*** was \$13.84. Profit per share for 2021 was \$11.83, and excluding the items in the table below, adjusted profit per share was \$10.81.
- In order for our results to be more meaningful to our readers, we have separately quantified the impact of several significant items. A detailed reconciliation of GAAP to non-GAAP financial measures is included on page 49.

	Full Year 2022		Full Year 2021	
	Profit Before Taxes	Profit Per Share	Profit Before Taxes	Profit Per Share
(Dollars in millions except per share data)				
Profit	\$ 8,752	\$ 12.64	\$ 8,204	\$ 11.83
Goodwill impairment.....	925	1.68	—	—
Restructuring costs	299	0.43	90	0.15
Mark-to-market (gains) losses	(606)	(0.91)	(833)	(1.17)
Adjusted profit.....	\$ 9,370	\$ 13.84	\$ 7,461	\$ 10.81

- Enterprise operating cash flow was \$7.8 billion in 2022. Caterpillar ended 2022 with \$7.0 billion of enterprise cash.

OVERVIEW

Our sales and revenues for 2022 were \$59.427 billion, an increase of \$8.456 billion, or 17 percent, compared with \$50.971 billion for 2021. The increase was primarily due to favorable ***price realization*** and higher ***sales volume***, partially offset by unfavorable ***currency*** impacts related to the euro, Australian dollar and Japanese yen. Profit per share was \$12.64 in 2022, compared with profit per share of \$11.83 in 2021. Profit was \$6.705 billion in 2022, compared with \$6.489 billion in 2021. The increase was primarily due to favorable price realization and higher sales volume, partially offset by unfavorable ***manufacturing costs***, a goodwill impairment charge, higher selling, general and administrative (SG&A) and research and development (R&D) expenses, lower mark-to-market gains for remeasurement of ***pension and other postemployment benefit (OPEB)*** plans and higher restructuring costs.

Trends and Economic Conditions**Outlook for Key End Markets**

In Construction Industries, we see positive momentum in 2023 for North America. We expect non-residential construction in North America to grow due to the positive impact of government-related infrastructure investments, healthy backlogs and rental replenishment. Residential construction continues to moderate due to tightening financial conditions but remains at a healthy level. In Asia Pacific, excluding China, we expect growth due to public infrastructure spending and supportive commodity prices. We expect continued weakness in China in the excavator industry above 10-tons, which we anticipate to remain below 2022 levels due to low construction activity. In ***EAME***, business activity is expected to be about flat versus 2022 based on healthy backlogs and strong construction demand in the Middle East, offset by uncertain economic conditions in Europe. Construction activity in ***Latin America*** is expected to be flat to slightly down versus a strong 2022 performance.

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In Resource Industries, we expect healthy mining demand to continue as commodity prices remain above investment thresholds; however, customers continue to remain capital disciplined. We anticipate production and utilization levels will remain elevated, and our autonomous solutions continue to gain momentum. We expect the continuation of high equipment utilization and a low level of parked trucks, which support future demand for our equipment and services. The energy transition is expected to support increased commodity demand, expanding our total addressable market and providing opportunities for profitable growth. In heavy construction and quarry and aggregates, we anticipate continued growth supported by infrastructure and major non-residential construction projects.

In Energy & Transportation, we expect sales growth due to strong order rates in most applications. In Oil & Gas, although customers remain disciplined, we are encouraged by continued strength in demand and order intake for the year. New equipment orders for Solar Turbines continue to be robust. Power Generation orders are expected to remain healthy, including data center strength. Industrial remains healthy with momentum continuing for 2023. In Rail, North America new locomotives are expected to remain muted. We anticipate strength in high-speed marine as customers continue to upgrade aging fleets.

Company Trends and Expectations

For the full-year 2023, we expect sales to increase compared to 2022, supported by favorable price realization. Although we expect stronger sales of equipment to end users in 2023, we do not anticipate a significant change in dealer inventory by year end. 2023 sales are expected to follow a more traditional seasonal pattern, with first quarter being the lowest of the year. Demand remains strong given the robust order backlog and improving supply chain dynamics. In addition, services momentum is expected to continue this year as we continue to execute our services growth strategy.

We expect sales to increase in the first quarter of 2023, compared to the first quarter of 2022, driven by favorable price realization and slightly stronger sales volume, which reflects higher sales of equipment to end users. We expect a seasonal build in dealer inventory in the first quarter of 2023. Sales should increase across the three primary segments in the first quarter of 2023, compared to the first quarter of 2022.

We expect operating profit to increase in 2023, compared to 2022. Pricing actions from 2022 will continue to impact 2023 and we will evaluate future actions as appropriate to offset inflationary pressures. We currently expect to see moderation of price realization and input cost inflation throughout 2023. Price realization is expected to more than offset manufacturing costs for 2023. Increases in SG&A/R&D expenses are expected to exceed the benefit of lower short-term incentive compensation expense in 2023 as we continue to invest in strategic initiatives such as services growth and technology, including digital, electrification and autonomy. We anticipate higher pension expense within other income (expense) in 2023, compared to 2022, due to higher interest costs from higher interest rates. This non-cash item is estimated to be just over \$300 million for the full year, or about \$80 million per quarter. Finally, the strengthening of the U.S. dollar in 2022 acted as a benefit to profit within other income (expense), which would not re-occur if the weakening we have seen in rates continues.

Global Business Conditions

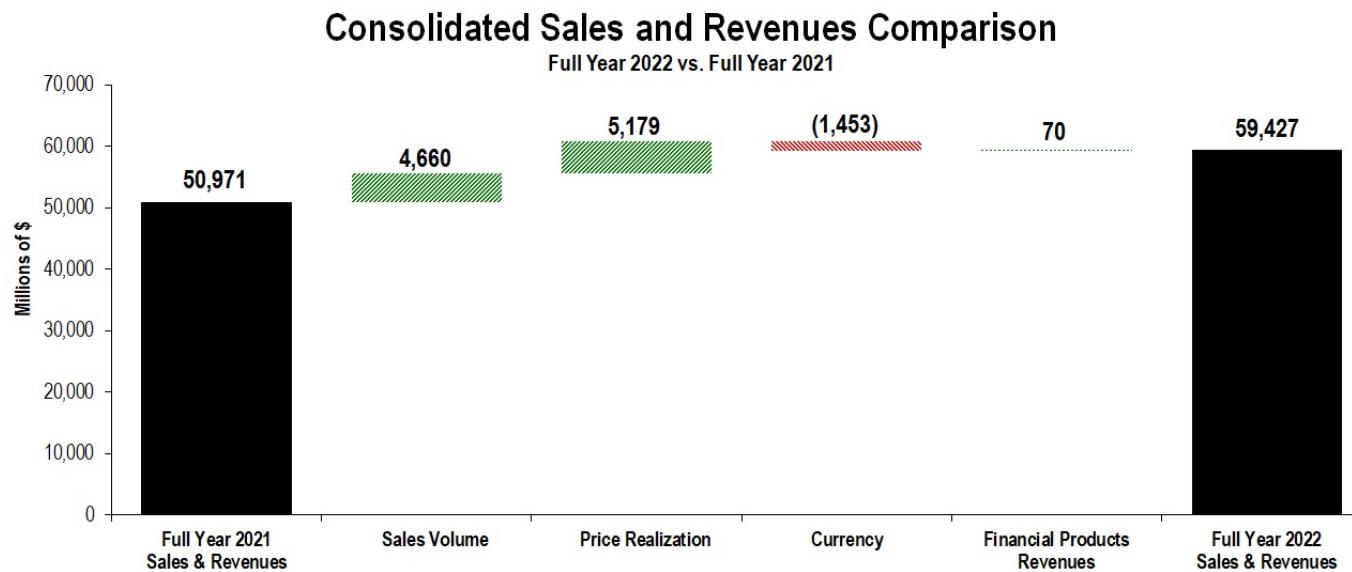
We continue to monitor a variety of external factors around the world, such as supply chain disruptions, inflationary cost and labor pressures. Areas of particular focus include certain components, transportation and raw materials. Transportation shortages have resulted in delays and increased costs. In addition, our suppliers are dealing with availability issues and freight delays, which could impact production in our facilities. Contingency plans have been developed and continue to be modified to minimize supply chain challenges that may impact our ability to meet increasing customer demand. We continue to assess the environment and are taking appropriate price actions in response to rising costs.

Risk Factors

Risk factors are disclosed within Item 1A. Risk Factors of the 2022 Form 10-K.

Notes:

- Glossary of terms included on pages 35-37; first occurrence of terms shown in bold italics.
- Information on non-GAAP financial measures is included on page 49.
- Some amounts within this report are rounded to the millions or billions and may not add. In addition, the sum of the components reported across periods may not equal the total amount reported year-to-date due to rounding.

[Table of Contents](#)**2022 COMPARED WITH 2021****CONSOLIDATED SALES AND REVENUES**

The chart above graphically illustrates reasons for the change in consolidated sales and revenues between 2021 (at left) and 2022 (at right). Caterpillar management utilizes these charts internally to visually communicate with the company's Board of Directors and employees.

Total sales and revenues for 2022 were \$59.427 billion, an increase of \$8.456 billion, or 17 percent, compared with \$50.971 billion in 2021. The increase was primarily due to favorable price realization and higher sales volume, partially offset by unfavorable currency impacts related to the euro, Australian dollar and Japanese yen. The increase in sales volume was driven by the impact from changes in **dealer inventories**, increased **services** and higher sales of equipment to end users. Dealers increased their inventories about \$2.4 billion in 2022, compared to a decrease of about \$100 million in 2021.

Sales were higher in the three primary segments.

North America sales increased 29 percent driven by favorable price realization, the impact from changes in dealer inventories, increased services and higher sales of equipment to end users. Dealers increased inventories during 2022, compared to a decrease during 2021.

Sales increased 33 percent in Latin America due to higher sales of equipment to end users, favorable price realization and the impact from changes in dealer inventories. Dealers increased inventories more during 2022 than during 2021.

EAME sales increased 6 percent due to favorable price realization, the impact from changes in dealer inventories and higher sales of equipment to end users, partially offset by unfavorable currency impacts related to the euro and British pound. Dealers increased inventories more during 2022 than during 2021.

Asia/Pacific sales increased 2 percent driven by favorable price realization, the impact from changes in dealer inventories and higher services, partially offset by lower sales of equipment to end users and unfavorable currency impacts related to the Australian dollar and Japanese yen. Dealers increased their inventories during 2022, compared to remaining about flat during 2021.

Dealers increased their inventories about \$2.4 billion in 2022, compared to a decrease of about \$100 million in 2021. Dealers are independent, and the reasons for changes in their inventory levels vary, including their expectations of future demand and product delivery times. Dealers' demand expectations take into account seasonal changes, macroeconomic conditions, machine rental rates and other factors. Delivery times can vary based on availability of product from Caterpillar factories and product distribution centers. We expect dealer inventories to be about flat in 2023 compared to 2022.

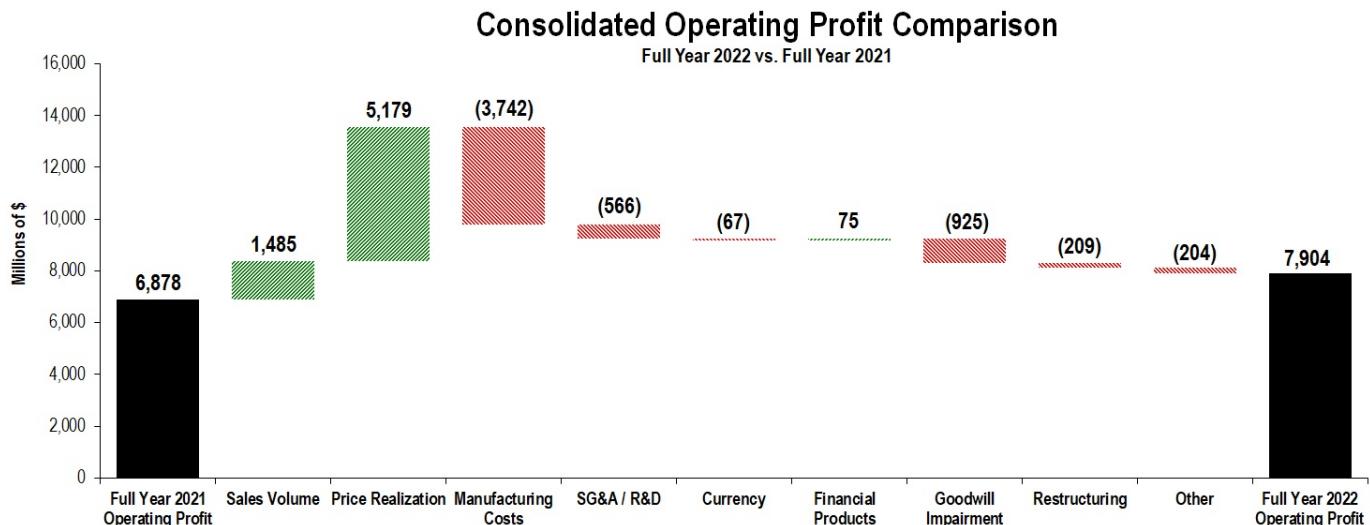
[Table of Contents](#)**Sales and Revenues by Segment**

(Millions of dollars)	2021	Sales Volume	Price Realization	Currency	Inter-Segment / Other	2022	\$ Change	% Change
Construction Industries	\$ 22,106	\$ 1,231	\$ 2,633	\$ (731)	\$ 30	\$ 25,269	\$ 3,163	14 %
Resource Industries	9,810	1,372	1,333	(194)	(7)	12,314	2,504	26 %
Energy & Transportation	20,287	1,972	1,216	(521)	798	23,752	3,465	17 %
All Other Segment	511	3	4	(7)	(61)	450	(61)	(12 %)
Corporate Items and Eliminations	(4,526)	82	(7)	—	(760)	(5,211)	(685)	—
Machinery, Energy & Transportation	48,188	4,660	5,179	(1,453)	—	56,574	8,386	17 %
Financial Products Segment	3,073	—	—	—	180	3,253	180	6 %
Corporate Items and Eliminations	(290)	—	—	—	(110)	(400)	(110)	—
Financial Products Revenues	2,783	—	—	—	70	2,853	70	3 %
Consolidated Sales and Revenues	<u>\$ 50,971</u>	<u>\$ 4,660</u>	<u>\$ 5,179</u>	<u>\$ (1,453)</u>	<u>\$ 70</u>	<u>\$ 59,427</u>	<u>\$ 8,456</u>	<u>17 %</u>

Sales and Revenues by Geographic Region

(Millions of dollars)	North America		Latin America		EAME		Asia/Pacific		External Sales and Revenues		Inter-Segment		Total Sales and Revenues	
	\$	% Chg	\$	% Chg	\$	% Chg	\$	% Chg	\$	% Chg	\$	% Chg	\$	% Chg
2022														
Construction Industries	\$ 12,367	28%	\$ 2,843	49%	\$ 5,099	5%	\$ 4,818	(13%)	\$ 25,127	14%	\$ 142	27%	\$ 25,269	14 %
Resource Industries	4,531	52%	1,840	7%	2,205	11%	3,437	23%	12,013	26%	301	(2%)	12,314	26 %
Energy & Transportation	9,175	21%	1,784	45%	5,232	7%	3,146	8%	19,337	16%	4,415	22%	23,752	17 %
All Other Segment	64	14%	2	—%	(66)	(467%)	145	110%	145	—%	305	(17%)	450	(12 %)
Corporate Items and Eliminations	(29)	—	(1)	—	(5)	—	(13)	—	(48)	—	(5,163)	—	(5,211)	—
Machinery, Energy & Transportation	<u>26,108</u>	<u>29%</u>	<u>6,468</u>	<u>33%</u>	<u>12,465</u>	<u>6%</u>	<u>11,533</u>	<u>2%</u>	<u>56,574</u>	<u>17%</u>	<u>—</u>	<u>—%</u>	<u>56,574</u>	<u>17 %</u>
Financial Products Segment	2,078	7%	348	31%	396	(1%)	431	(8%)	3,253	—	—	—%	3,253	6 %
Corporate Items and Eliminations	(205)	—	(78)	—	(47)	—	(70)	—	(400)	—	—	—	(400)	—
Financial Products Revenues	<u>1,873</u>	<u>4%</u>	<u>270</u>	<u>26%</u>	<u>349</u>	<u>(5%)</u>	<u>361</u>	<u>(10%)</u>	<u>2,853</u>	<u>3%</u>	<u>—</u>	<u>—%</u>	<u>2,853</u>	<u>3 %</u>
Consolidated Sales and Revenues	<u><u>\$ 27,981</u></u>	<u><u>27%</u></u>	<u><u>\$ 6,738</u></u>	<u><u>32%</u></u>	<u><u>\$ 12,814</u></u>	<u><u>6%</u></u>	<u><u>\$ 11,894</u></u>	<u><u>1%</u></u>	<u><u>\$ 59,427</u></u>	<u><u>17%</u></u>	<u><u>\$ —</u></u>	<u><u>—%</u></u>	<u><u>\$ 59,427</u></u>	<u><u>17 %</u></u>
2021														
Construction Industries	\$ 9,676	—	\$ 1,913	—	\$ 4,858	—	\$ 5,547	—	\$ 21,994	—	\$ 112	—	\$ 22,106	—
Resource Industries	2,987	—	1,724	—	1,987	—	2,804	—	9,502	—	308	—	9,810	—
Energy & Transportation	7,611	—	1,233	—	4,908	—	2,918	—	16,670	—	3,617	—	20,287	—
All Other Segment	56	—	2	—	18	—	69	—	145	—	366	—	511	—
Corporate Items and Eliminations	(106)	—	(1)	—	(1)	—	(15)	—	(123)	—	(4,403)	—	(4,526)	—
Machinery, Energy & Transportation	<u>20,224</u>	<u>—</u>	<u>4,871</u>	<u>—</u>	<u>11,770</u>	<u>—</u>	<u>11,323</u>	<u>—</u>	<u>48,188</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>48,188</u>	<u>—</u>
Financial Products Segment	1,935	—	265	—	402	—	471	—	3,073	—	—	—	3,073	—
Corporate Items and Eliminations	(136)	—	(50)	—	(35)	—	(69)	—	(290)	—	—	—	(290)	—
Financial Products Revenues	<u>1,799</u>	<u>—</u>	<u>215</u>	<u>—</u>	<u>367</u>	<u>—</u>	<u>402</u>	<u>—</u>	<u>2,783</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>2,783</u>	<u>—</u>
Consolidated Sales and Revenues	<u><u>\$ 22,023</u></u>	<u><u>\$ 5,086</u></u>	<u><u>\$ 12,137</u></u>	<u><u>\$ 11,725</u></u>	<u><u>\$ 50,971</u></u>	<u><u>\$ —</u></u>	<u><u>\$ 50,971</u></u>	<u><u>\$ —</u></u>	<u><u>\$ 50,971</u></u>	<u><u>\$ —</u></u>	<u><u>\$ 50,971</u></u>	<u><u>\$ —</u></u>	<u><u>\$ 50,971</u></u>	<u><u>\$ —</u></u>

¹ Includes revenues from Machinery, Energy & Transportation of \$478 million and \$351 million in 2022 and 2021, respectively.

[Table of Contents](#)**CONSOLIDATED OPERATING PROFIT**

The chart above graphically illustrates reasons for the change in consolidated operating profit between 2021 (at left) and 2022 (at right). Caterpillar management utilizes these charts internally to visually communicate with the company's Board of Directors and employees. The bar entitled Other includes **consolidating adjustments** and **Machinery, Energy & Transportation other operating (income) expenses**.

Operating profit was \$7.904 billion in 2022, an increase of \$1.026 billion, or 15 percent, compared with \$6.878 billion in 2021. The increase was primarily due to favorable price realization and higher sales volume, partially offset by higher manufacturing costs, a goodwill impairment charge, higher SG&A/R&D expenses and higher restructuring costs.

Unfavorable manufacturing costs reflected higher material costs, freight and manufacturing inefficiencies. The increase in SG&A/R&D expenses was driven by investments aligned with the company's strategy for profitable growth, which included services growth and technology, such as digital, electrification and autonomy, as well as higher short-term incentive compensation expense.

Short-term incentive compensation expense is directly related to financial and operational performance, measured against targets set annually. Expense for 2022 was about \$1.4 billion, compared with \$1.3 billion in 2021. For 2023, we expect short-term incentive compensation expense will be about \$1.1 billion.

In 2022, the company took a goodwill impairment charge of \$925 million and restructuring costs of \$193 million related to the Rail division, both primarily non-cash items. \$180 million of the total Rail restructuring costs were recognized in the fourth quarter of 2022. The goodwill impairment charge is related to a lower outlook for the company's locomotive offerings. The restructuring costs were primarily related to write-downs in the value of inventory.

Operating profit margin was 13.3 percent in 2022, compared with 13.5 percent in 2021.

Profit (Loss) by Segment

(Millions of dollars)	2022	2021	\$ Change	% Change
Construction Industries	\$ 4,743	\$ 3,732	\$ 1,011	27 %
Resource Industries	1,827	1,229	598	49 %
Energy & Transportation	3,309	2,804	505	18 %
All Other Segment	(11)	(14)	3	21 %
Corporate Items and Eliminations	(2,435)	(1,388)	(1,047)	
Machinery, Energy & Transportation	7,433	6,363	1,070	17 %
Financial Products Segment	864	908	(44)	(5 %)
Corporate Items and Eliminations	26	(92)	118	
Financial Products	890	816	74	9 %
Consolidating Adjustments	(419)	(301)	(118)	
Consolidated Operating Profit	\$ 7,904	\$ 6,878	\$ 1,026	15 %

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- Interest expense excluding Financial Products in 2022 was \$443 million, compared with \$488 million in 2021. The decrease was due to lower average debt outstanding during 2022, compared with 2021.

Other income (expense) in 2022 was income of \$1.291 billion, compared with income of \$1.814 billion in 2021. The change was primarily due to lower mark-to-market gains for remeasurement of OPEB plans, lower pension and OPEB income and unrealized losses on marketable securities, partially offset by higher investment and interest income.

- The provision for income taxes for 2022 reflected an annual effective tax rate of 23.2 percent, compared with 22.9 percent for 2021, excluding the discrete items discussed below.

On September 8, 2022, the company reached a settlement with the U.S. Internal Revenue Service (IRS) that resolves all issues for tax years 2007 through 2016, without any penalties. The company's settlement includes, among other issues, the resolution of disputed tax treatment of profits earned by Caterpillar SARL (CSARL) from certain parts transactions. We vigorously contested the IRS's application of the "substance-over-form" or "assignment-of-income" judicial doctrines and its proposed increases to tax and imposition of accuracy related penalties. The settlement does not include any increases to tax in the United States based on those judicial doctrines and does not include any penalties. The final tax assessed by the IRS for all issues under the settlement was \$490 million for the ten-year period. This amount was primarily paid in 2022 along with the associated interest of \$250 million. The settlement was within the total amount of gross unrecognized tax benefits for uncertain tax positions and enables us to avoid the costs and burdens of further disputes with the IRS. As a result of the settlement, we recorded a discrete tax benefit of \$41 million in 2022 to reflect changes in estimates of prior years' taxes and related interest, net of tax. We are subject to the continuous examination of our income tax returns by the IRS, and tax years 2017 to 2019 are currently under examination.

The provision for income taxes also included the following:

- A tax charge of \$124 million related to \$606 million of pension and OPEB mark-to-market gains in 2022, compared to a \$190 million tax charge related to \$833 million of mark-to-market gains in 2021.
- A tax benefit of \$49 million to reflect other changes in estimates related to prior year's U.S. taxes in 2022 compared to \$36 million in 2021.
- A tax benefit of \$36 million related to the \$925 million goodwill impairment charge in 2022.
- A tax benefit of \$33 million in 2022, compared with \$63 million in 2021, for the settlement of stock-based compensation awards with associated tax deductions in excess of cumulative U.S. GAAP compensation expense.
- A tax benefit of \$38 million in 2021 to recognize U.S. capital losses.

Construction Industries

Construction Industries' total sales were \$25.269 billion in 2022, an increase of \$3.163 billion, or 14 percent, compared with \$22.106 billion in 2021. The increase was due to favorable price realization and higher sales volume, partially offset by unfavorable currency impacts related to the euro, Japanese yen and Australian dollar. The increase in sales volume was driven by the impact from changes in dealer inventories and higher sales of aftermarket parts, partially offset by lower sales of equipment to end users. Dealers increased inventories during 2022, compared to remaining about flat in 2021.

- In North America, sales increased due to favorable price realization, the impact from changes in dealer inventories, higher sales of equipment to end users and higher sales of aftermarket parts. Dealers decreased inventories during 2021, compared with an increase during 2022.
- Sales increased in Latin America primarily due to higher sales of equipment to end users, favorable price realization and the impact from changes in dealer inventories. Dealers increased inventories more during 2022 than during 2021.
- In EAME, sales increased due to favorable price realization and the impact from changes in dealer inventories, partially offset by unfavorable currency impacts related to the euro. Dealers increased inventories more during 2022 than during 2021.
- Sales decreased in Asia/Pacific due to lower sales of equipment to end users and unfavorable currency impacts related to the Japanese yen and Australian dollar, partially offset by favorable price realization.

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Construction Industries' profit was \$4.743 billion in 2022, an increase of \$1.011 billion, or 27 percent, compared with \$3.732 billion in 2021. The increase was mainly due to favorable price realization and higher sales volume, partially offset by unfavorable manufacturing costs and higher SG&A/R&D expenses. Unfavorable manufacturing costs largely reflected higher material costs, freight and the impact of manufacturing inefficiencies. The increase in SG&A/R&D expenses was primarily driven by investments aligned with strategic initiatives.

Construction Industries' profit as a percent of total sales was 18.8 percent in 2022, compared with 16.9 percent in 2021.

Resource Industries

Resource Industries' total sales were \$12.314 billion in 2022, an increase of \$2.504 billion, or 26 percent, compared with \$9.810 billion in 2021. The increase was due to higher sales volume and favorable price realization. The increase in sales volume was driven by the impact from changes in dealer inventories, higher sales of equipment to end users and higher sales of aftermarket parts. Dealers increased inventories during 2022, compared with a decrease during 2021.

Resource Industries' profit was \$1.827 billion in 2022, an increase of \$598 million, or 49 percent, compared with \$1.229 billion in 2021. The increase was mainly due to favorable price realization and higher sales volume, partially offset by unfavorable manufacturing costs and higher SG&A/R&D expenses. Unfavorable manufacturing costs largely reflected higher material costs and freight. The increase in SG&A/R&D expenses was primarily driven by investments aligned with strategic initiatives.

Resource Industries' profit as a percent of total sales was 14.8 percent for 2022, compared with 12.5 percent for 2021.

Energy & Transportation

Sales by Application (Millions of dollars)	2022	2021	\$ Change	% Change
Oil and Gas	\$ 5,330	\$ 4,460	\$ 870	20 %
Power Generation	4,940	4,292	648	15 %
Industrial	4,426	3,612	814	23 %
Transportation	4,641	4,306	335	8 %
External Sales	19,337	16,670	2,667	16 %
Inter-Segment	4,415	3,617	798	22 %
Total Sales	\$ 23,752	\$ 20,287	\$ 3,465	17 %

Energy & Transportation's total sales were \$23.752 billion in 2022, an increase of \$3.465 billion, or 17 percent, compared with \$20.287 billion in 2021. Sales increased across all applications and inter-segment sales. The increase in sales was primarily due to higher sales volume and favorable price realization, partially offset by unfavorable currency impacts related to the euro, British pound and Australian dollar.

- Oil and Gas – Sales increased due to higher sales of reciprocating engine aftermarket parts and engines used in well servicing and gas compression applications. Turbines and turbine-related services were about flat.
- Power Generation – Sales primarily increased in reciprocating engines and aftermarket parts.
- Industrial – Sales increased due to higher demand across all regions.
- Transportation – Sales increased primarily in reciprocating aftermarket parts and engines, mostly driven by marine applications. Rail services also increased.

Energy & Transportation's profit was \$3.309 billion in 2022, an increase of \$505 million, or 18 percent, compared with \$2.804 billion in 2021. Unfavorable manufacturing costs and higher SG&A/R&D expenses were more than offset by favorable price realization and higher sales volume. Unfavorable manufacturing costs largely reflected higher material costs, freight, period manufacturing costs and the impact of manufacturing inefficiencies. The increase in SG&A/R&D expenses was primarily driven by investments aligned with strategic initiatives and higher short-term incentive compensation expense.

Energy & Transportation's profit as a percent of total sales was 13.9 percent in 2022, compared with 13.8 percent in 2021.

Financial Products Segment

Financial Products' segment revenues were \$3.253 billion for the year ended December 31, 2022, an increase of \$180 million, or 6 percent, compared with \$3.073 billion for the year ended December 31, 2021. The increase was primarily due to higher average financing rates across all regions and a favorable impact from returned or reposessed equipment in North America.

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Financial Products' segment profit was \$864 million for the year ended December 31, 2022, a decrease of \$44 million, or 5 percent, compared with \$908 million for the year ended December 31, 2021. The decrease was mainly due to an unfavorable impact from equity securities in Insurance Services, partially offset by a favorable impact from returned or repossessed equipment.

At the end of 2022, past dues at Cat Financial were 1.89 percent, compared with 1.95 percent at the end of 2021. Write-offs, net of recoveries, were \$46 million for 2022, compared with \$205 million for 2021. As of December 31, 2022, Cat Financial's allowance for credit losses totaled \$346 million, or 1.29 percent of finance receivables, compared with \$337 million, or 1.22 percent of finance receivables, at December 31, 2021.

Corporate Items and Eliminations

Expense for corporate items and eliminations was \$2.409 billion in 2022, an increase of \$929 million from 2021, primarily driven by a goodwill impairment charge and higher restructuring costs, partially offset by favorable impacts of segment reporting methodology and a favorable change in fair value adjustments related to deferred compensation plans.

In 2022, the company took a goodwill impairment charge of \$925 million and restructuring costs of \$193 million related to the Rail division, both primarily non-cash items. \$180 million of the total Rail restructuring costs were recognized in the fourth quarter of 2022. The goodwill impairment charge is related to a lower outlook for the company's locomotive offerings. The restructuring costs were primarily related to write-downs in the value of inventory.

2021 COMPARED WITH 2020

For discussions related to the consolidated sales and revenue and consolidated operating profit between 2021 and 2020, refer to Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations of the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2021, which was filed with the United States Securities and Exchange Commission on February 16, 2022 and hereby incorporated by reference.

RESTRUCTURING COSTS

On February 1, 2023, we closed on the divestiture of our Longwall business. As a result, we recorded a pre-tax loss of approximately \$600 million, of which \$494 million was related to the release of accumulated foreign currency translation associated with this divestiture. This loss, primarily non-cash, will be included in our first quarter 2023 restructuring costs and is subject to the finalization of post-closing procedures. In addition, we expect to incur about \$100 million of restructuring costs in 2023 primarily related to strategic actions to address a small number of products.

We expect that prior restructuring actions will result in an incremental benefit to operating costs, primarily Costs of goods sold and SG&A expenses of about \$100 million in 2023 compared with 2022.

Additional information related to restructuring costs is included in Note 25 - "Restructuring Costs" of Part II, Item 8 "Financial Statements and Supplemental Data."

GLOSSARY OF TERMS

1. **Adjusted Operating Profit Margin** – Operating profit excluding goodwill impairment charges and restructuring income/costs as a percent of sales and revenues.
2. **Adjusted Profit Per Share** – Profit per share excluding goodwill impairment charges, pension and OPEB mark-to-market gains/losses and restructuring income/costs.
3. **All Other Segment** – Primarily includes activities such as: business strategy; product management and development; manufacturing and sourcing of filters and fluids, undercarriage, ground-engaging tools, fluid transfer products, precision seals, rubber sealing and connecting components primarily for Cat® products; parts distribution; integrated logistics solutions; distribution services responsible for dealer development and administration, including a wholly owned dealer in Japan; dealer portfolio management and ensuring the most efficient and effective distribution of machines, engines and parts; brand management and marketing strategy; and digital investments for new customer and dealer solutions that integrate data analytics with state-of-the-art digital technologies while transforming the buying experience.
4. **Consolidating Adjustments** – Elimination of transactions between Machinery, Energy & Transportation and Financial Products.

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5. **Construction Industries** – A segment primarily responsible for supporting customers using machinery in infrastructure and building construction applications. Responsibilities include business strategy, product design, product management and development, manufacturing, marketing and sales and product support. The product portfolio includes asphalt pavers; backhoe loaders; compactors; cold planers; compact track and multi-terrain loaders; mini, small, medium and large track excavators; forestry machines; material handlers; motor graders; pipelayers; road reclaimers; skid steer loaders; telehandlers; small and medium track-type tractors; track-type loaders; wheel excavators; compact, small and medium wheel loaders; and related parts and work tools.
6. **Corporate Items and Eliminations** – Includes corporate-level expenses, timing differences (as some expenses are reported in segment profit on a cash basis), methodology differences between segment and consolidated external reporting, certain restructuring costs and inter-segment eliminations.
7. **Currency** – With respect to sales and revenues, currency represents the translation impact on sales resulting from changes in foreign currency exchange rates versus the U.S. dollar. With respect to operating profit, currency represents the net translation impact on sales and operating costs resulting from changes in foreign currency exchange rates versus the U.S. dollar. Currency only includes the impact on sales and operating profit for the Machinery, Energy & Transportation line of business; currency impacts on Financial Products revenues and operating profit are included in the Financial Products portions of the respective analyses. With respect to other income/expense, currency represents the effects of forward and option contracts entered into by the company to reduce the risk of fluctuations in exchange rates (hedging) and the net effect of changes in foreign currency exchange rates on our foreign currency assets and liabilities for consolidated results (translation).
8. **Dealer Inventories** – Represents dealer machine and engine inventories, excluding aftermarket parts.
9. **EAME** – A geographic region including Europe, Africa, the Middle East and the Commonwealth of Independent States (CIS).
10. **Earning Assets** – Assets consisting primarily of total finance receivables net of unearned income, plus equipment on operating leases, less accumulated depreciation at Cat Financial.
11. **Energy & Transportation** – A segment primarily responsible for supporting customers using reciprocating engines, turbines, diesel-electric locomotives and related services across industries serving Oil and Gas, Power Generation, Industrial and Transportation applications, including marine- and rail-related businesses. Responsibilities include business strategy, product design, product management, development and testing manufacturing, marketing and sales and product support. The product and services portfolio includes turbines, centrifugal gas compressors, and turbine-related services; reciprocating engine-powered generator sets; integrated systems and solutions used in the electric power generation industry; reciprocating engines, drivetrain and integrated systems and solutions for the marine and oil and gas industries; reciprocating engines, drivetrain and integrated systems and solutions supplied to the industrial industry as well as Cat machinery; electrified powertrain and zero-emission power sources and service solutions development; and diesel-electric locomotives and components and other rail-related products and services, including remanufacturing and leasing. Responsibilities also include the remanufacturing of Caterpillar reciprocating engines and components and remanufacturing services for other companies; and product support of on-highway vocational trucks for North America.
12. **Financial Products** – The company defines Financial Products as our finance and insurance subsidiaries, primarily Caterpillar Financial Services Corporation (Cat Financial) and Caterpillar Insurance Holdings Inc. (Insurance Services). Financial Products' information relates to the financing to customers and dealers for the purchase and lease of Caterpillar and other equipment.
13. **Financial Products Segment** – Provides financing alternatives to customers and dealers around the world for Caterpillar products and services, as well as financing for vehicles, power generation facilities and marine vessels that, in most cases, incorporate Caterpillar products. Financing plans include operating and finance leases, installment sale contracts, repair/rebuild financing, working capital loans and wholesale financing plans. The segment also provides insurance and risk management products and services that help customers and dealers manage their business risk. Insurance and risk management products offered include physical damage insurance, inventory protection plans, extended service coverage and maintenance plans for machines and engines, and dealer property and casualty insurance. The various forms of financing, insurance and risk management products offered to customers and dealers help support the purchase and lease of Caterpillar equipment. The segment also earns revenues from Machinery, Energy & Transportation, but the related costs are not allocated to operating segments. Financial Products' segment profit is determined on a pretax basis and includes other income/expense items.
14. **Latin America** – A geographic region including Central and South American countries and Mexico.
15. **Machinery, Energy & Transportation (ME&T)** – The company defines ME&T as Caterpillar Inc. and its subsidiaries, excluding Financial Products. ME&T's information relates to the design, manufacturing and marketing of its products.

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16. **Machinery, Energy & Transportation Other Operating (Income) Expenses** – Comprised primarily of gains/losses on disposal of long-lived assets, gains/losses on divestitures and legal settlements and accruals.
17. **Manufacturing Costs** – Manufacturing costs exclude the impacts of currency and represent the volume-adjusted change for variable costs and the absolute dollar change for period manufacturing costs. Variable manufacturing costs are defined as having a direct relationship with the volume of production. This includes material costs, direct labor and other costs that vary directly with production volume, such as freight, power to operate machines and supplies that are consumed in the manufacturing process. Period manufacturing costs support production but are defined as generally not having a direct relationship to short-term changes in volume. Examples include machinery and equipment repair, depreciation on manufacturing assets, facility support, procurement, factory scheduling, manufacturing planning and operations management.
18. **Mark-to-market gains/losses** – Represents the net gain or loss of actual results differing from the company's assumptions and the effects of changing assumptions for our defined benefit pension and OPEB plans. These gains and losses are immediately recognized through earnings upon the annual remeasurement in the fourth quarter, or on an interim basis as triggering events warrant remeasurement.
19. **Pension and Other Postemployment Benefits (OPEB)** – The company's defined-benefit pension and postretirement benefit plans.
20. **Price Realization** – The impact of net price changes excluding currency and new product introductions. Price realization includes geographic mix of sales, which is the impact of changes in the relative weighting of sales prices between geographic regions.
21. **Resource Industries** – A segment primarily responsible for supporting customers using machinery in mining, heavy construction and quarry and aggregates. Responsibilities include business strategy, product design, product management and development, manufacturing, marketing and sales and product support. The product portfolio includes large track-type tractors; large mining trucks; hard rock vehicles; longwall miners; electric rope shovels; draglines; hydraulic shovels; rotary drills; large wheel loaders; off-highway trucks; articulated trucks; wheel tractor scrapers; wheel dozers; landfill compactors; soil compactors; select work tools; machinery components; electronics and control systems and related parts. In addition to equipment, Resource Industries also develops and sells technology products and services to provide customers fleet management, equipment management analytics, autonomous machine capabilities, safety services and mining performance solutions. Resource Industries also manages areas that provide services to other parts of the company, including strategic procurement, lean center of excellence, integrated manufacturing, research and development for hydraulic systems, automation, electronics and software for Cat machines and engines.
22. **Restructuring Costs** – May include costs for employee separation, long-lived asset impairments and contract terminations. These costs are included in Other operating (income) expenses except for defined-benefit plan curtailment losses and special termination benefits, which are included in Other income (expense). Restructuring costs also include other exit-related costs, which may consist of accelerated depreciation, inventory write-downs, building demolition, equipment relocation and project management costs and LIFO inventory decrement benefits from inventory liquidations at closed facilities, all of which are primarily included in Cost of goods sold.
23. **Sales Volume** – With respect to sales and revenues, sales volume represents the impact of changes in the quantities sold for Machinery, Energy & Transportation as well as the incremental sales impact of new product introductions, including emissions-related product updates. With respect to operating profit, sales volume represents the impact of changes in the quantities sold for Machinery, Energy & Transportation combined with product mix as well as the net operating profit impact of new product introductions, including emissions-related product updates. Product mix represents the net operating profit impact of changes in the relative weighting of Machinery, Energy & Transportation sales with respect to total sales. The impact of sales volume on segment profit includes inter-segment sales.
24. **Services** – Enterprise services include, but are not limited to, aftermarket parts, Financial Products revenues and other service-related revenues. Machinery, Energy & Transportation segments exclude most Financial Products revenues.

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LIQUIDITY AND CAPITAL RESOURCES

Sources of funds

We generate significant capital resources from operating activities, which are the primary source of funding for our ME&T operations. Funding for these businesses is also available from commercial paper and long-term debt issuances. Financial Products' operations are funded primarily from commercial paper, term debt issuances and collections from its existing portfolio. During 2022, we had positive operating cash flow within both our ME&T and Financial Products' operations. On a consolidated basis, we ended 2022 with \$7.00 billion of cash, a decrease of \$2.25 billion from year-end 2021. In addition, ME&T has invested in available-for-sale debt securities that are considered highly liquid and are available for current operations. These securities are included in Prepaid expenses and other current assets and Other assets in the Consolidated Statement of Financial Position and were \$1.48 billion at the end of December 31, 2022. We intend to maintain a strong cash and liquidity position.

Consolidated operating cash flow for 2022 was \$7.77 billion, up \$568 million compared to 2021. The increase was primarily due to higher profit before taxes adjusted for non-cash items and decreased working capital requirements. Within working capital, changes in receivables, customer advances and accrued expenses favorably impacted cash flow, but were partially offset by changes in accounts payable. Partially offsetting these items were higher payments for short-term incentive compensation in the first quarter of 2022 as well as higher cash taxes paid which includes payments related to settlements with the U.S. Internal Revenue Service.

Total debt as of December 31, 2022 was \$36.99 billion, a decrease of \$796 million from year-end 2021. Debt related to ME&T decreased \$174 million in 2022. Debt related to Financial products decreased by \$617 million due to portfolio funding requirements.

We have three global credit facilities with a syndicate of banks totaling \$10.50 billion (Credit Facility) available in the aggregate to both Caterpillar and Cat Financial for general liquidity purposes. Based on management's allocation decision, which can be revised from time to time, the portion of the Credit Facility available to ME&T as of December 31, 2022 was \$2.75 billion. Information on our Credit Facility is as follows:

- In September 2022, we entered into a new 364-day facility. The 364-day facility of \$3.15 billion (of which \$825 million is available to ME&T) expires in August 2023.
- In September 2022, we amended and restated the three-year facility (as amended and restated, the "three-year facility"). The three-year facility of \$2.73 billion (of which \$715 million is available to ME&T) expires in August 2025.
- In September 2022, we amended and restated the five-year facility (as amended and restated, the "five-year facility"). The five-year facility of \$4.62 billion (of which \$1.21 billion is available to ME&T) expires in September 2027.

At December 31, 2022, Caterpillar's consolidated net worth was \$15.93 billion, which was above the \$9.00 billion required under the Credit Facility. The consolidated net worth is defined as the consolidated shareholders' equity including preferred stock but excluding the pension and other postretirement benefits balance within Accumulated other comprehensive income (loss).

At December 31, 2022, Cat Financial's covenant interest coverage ratio was 2.36 to 1. This was above the 1.15 to 1 minimum ratio, calculated as (1) profit excluding income taxes, interest expense and net gain/(loss) from interest rate derivatives to (2) interest expense calculated at the end of each calendar quarter for the rolling four quarter period then most recently ended, required by the Credit Facility.

In addition, at December 31, 2022, Cat Financial's six-month covenant leverage ratio was 7.05 to 1 and year-end covenant leverage ratio was 7.21 to 1. This was below the maximum ratio of debt to net worth of 10 to 1, calculated (1) on a monthly basis as the average of the leverage ratios determined on the last day of each of the six preceding calendar months and (2) at each December 31, required by the Credit Facility.

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In the event Caterpillar or Cat Financial does not meet one or more of their respective financial covenants under the Credit Facility in the future (and are unable to obtain a consent or waiver), the syndicate of banks may terminate the commitments allocated to the party that does not meet its covenants. Additionally, in such event, certain of Cat Financial's other lenders under other loan agreements where similar financial covenants or cross default provisions are applicable, may, at their election, choose to pursue remedies under those loan agreements, including accelerating the repayment of outstanding borrowings. At December 31, 2022, there were no borrowings under the Credit Facility.

Our total credit commitments and available credit as of December 31, 2022 were:

(Millions of dollars)	December 31, 2022		
	Consolidated	Machinery, Energy & Transportation	Financial Products
Credit lines available:			
Global credit facilities	\$ 10,500	\$ 2,750	\$ 7,750
Other external	3,649	158	3,491
Total credit lines available	14,149	2,908	11,241
Less: Commercial paper outstanding	(5,455)	—	(5,455)
Less: Utilized credit	(982)	(3)	(979)
Available credit	\$ 7,712	\$ 2,905	\$ 4,807

The other consolidated credit lines with banks as of December 31, 2022 totaled \$3.65 billion. These committed and uncommitted credit lines, which may be eligible for renewal at various future dates or have no specified expiration date, are used primarily by our subsidiaries for local funding requirements. Caterpillar or Cat Financial may guarantee subsidiary borrowings under these lines.

We receive debt ratings from the major credit rating agencies. Moody's, Fitch and S&P maintain a "mid-A" debt rating. A downgrade of our credit ratings by any of the major credit rating agencies could result in increased borrowing costs and could make access to certain credit markets more difficult. In the event economic conditions deteriorate such that access to debt markets becomes unavailable, ME&T's operations would rely on cash flow from operations, use of existing cash balances, borrowings from Cat Financial and access to our committed credit facilities. Our Financial Products' operations would rely on cash flow from its existing portfolio, existing cash balances, access to our committed credit facilities and other credit line facilities of Cat Financial, and potential borrowings from Caterpillar. In addition, we maintain a support agreement with Cat Financial, which requires Caterpillar to remain the sole owner of Cat Financial and may, under certain circumstances, require Caterpillar to make payments to Cat Financial should Cat Financial fail to maintain certain financial ratios.

We facilitate voluntary supply chain finance programs (the "Programs") through participating financial institutions. The Programs are available to a wide range of suppliers and allow them the option to manage their cash flow. We are not a party to the agreements between the participating financial institutions and the suppliers in connection with the Programs. The range of payment terms we negotiate with our suppliers is consistent, irrespective of whether a supplier participates in the Programs. The amounts payable to participating financial institutions for suppliers who voluntarily participate in the Programs and included in accounts payable in the Consolidated Statement of Financial Position were \$862 million and \$822 million at December 31, 2022 and December 31, 2021, respectively. The amounts settled through the Programs and paid to participating financial institutions were \$5.4 billion and \$4.1 billion in 2022 and 2021, respectively. We account for payments made under the Programs, the same as our other accounts payable, as a reduction to our cash flows from operations. We do not believe that changes in the availability of supply chain financing will have a significant impact on our liquidity.

Material cash requirements for contractual obligations

We believe our balances of cash and cash equivalents of \$7.00 billion and available-for-sale debt securities of \$1.48 billion as of December 31, 2022, along with cash generated by ongoing operations and continued access to debt markets, will be sufficient to satisfy our cash requirements over the next 12 months and beyond.

We have committed cash outflows related to postretirement benefit obligations, long-term debt and operating lease agreements. See Notes 12, 14 and 20, respectively, of Part II, Item 8 "Financial Statements and Supplementary Data" for additional information.

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We have short-term obligations related to the purchase of goods and services made in the ordinary course of business. These consist of invoices received and recorded as liabilities as of December 31, 2022, but scheduled for payment in 2023 of \$8.69 billion. In addition, we have contractual obligations for material and services on order at December 31, 2022, but not yet invoiced or delivered, of \$7.64 billion.

We also have long-term contractual obligations primarily for logistics services agreements; systems support, software licenses and development contracts; information technology consulting contracts and outsourcing contracts for benefit plan administration. These obligations total \$1.06 billion, with \$537 million due in the next 12 months.

Machinery, Energy & Transportation

Net cash provided by operating activities was \$6.36 billion in 2022, compared with \$7.18 billion in 2021. The decrease was primarily due to payments for short-term incentive compensation in the first quarter of 2022, higher payments for taxes which includes payments related to settlements with the U.S. Internal Revenue Service and increased working capital requirements in 2022. Within working capital, changes in accounts payable unfavorably impacted cash flow but were partially offset by favorable changes in customer advances and accounts receivable. Partially offsetting these items were higher profit before taxes adjusted for non-cash items.

Net cash used for investing activities in 2022 was \$1.81 billion, compared with net cash used of \$1.23 billion in 2021. The change was primarily due to decreased activity related to intercompany lending with Financial Products and was partially offset by decreases in net investment activity.

Net cash used for financing activities during 2022 was \$6.80 billion, compared with net cash used of \$6.30 billion in 2021. The change was primarily due to higher share repurchases in 2022 and the absence of proceeds from debt issuance which occurred in 2021. These items were partially offset by lower repayments of maturing debt in 2022.

While our short-term priorities for the use of cash may vary from time to time as business needs and conditions dictate, our long-term cash deployment strategy is focused on the following priorities. Our top priority is to maintain a strong financial position in support of a mid-A rating. Next, we intend to fund operational requirements and commitments. Then, we intend to fund priorities that profitably grow the company and return capital to shareholders through dividend growth and share repurchases. Additional information on cash deployment is as follows:

Strong financial position — Our top priority is to maintain a strong financial position in support of a mid-A rating. We track a diverse group of financial metrics that focus on liquidity, leverage, cash flow and margins which align with our cash deployment actions and the various methodologies used by the major credit rating agencies.

Operational excellence and commitments — Capital expenditures were \$1.30 billion during 2022, compared to \$1.13 billion in 2021. We expect ME&T's capital expenditures in 2023 to be around \$1.5 billion. We made \$346 million of contributions to our pension and OPEB plans during 2022. In comparison, we made \$340 million of contributions to our pension and OPEB plans in 2021. We expect to make approximately \$372 million of contributions to our pension and OPEB plans in 2023.

Fund strategic growth initiatives and return capital to shareholders — We intend to utilize our liquidity and debt capacity to fund targeted investments that drive long-term profitable growth focused in the areas of expanded offerings and services, including acquisitions.

As part of our capital allocation strategy, ME&T free cash flow is a liquidity measure we use to determine the cash generated and available for financing activities including debt repayments, dividends and share repurchases. We define ME&T free cash flow as cash from ME&T operations less capital expenditures, excluding discretionary pension and other postretirement benefit plan contributions and cash payments related to settlements with the U.S. Internal Revenue Service. A goal of our capital allocation strategy is to return substantially all ME&T free cash flow to shareholders over time in the form of dividends and share repurchases, while maintaining our mid-A rating.

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Our share repurchase plans are subject to the company's cash deployment priorities and are evaluated on an ongoing basis considering the financial condition of the company and the economic outlook, corporate cash flow, the company's liquidity needs and the health and stability of global credit markets. The timing and amount of future repurchases may vary depending on market conditions and investing priorities. In July 2018, the Board of Directors approved an authorization to repurchase up to \$10.0 billion of Caterpillar common stock (the 2018 Authorization) effective January 1, 2019, with no expiration. In May 2022, the Board approved a new share repurchase authorization (the 2022 Authorization) of up to \$15.0 billion of Caterpillar common stock effective August 1, 2022 with no expiration. Utilization of the 2022 Authorization for all share repurchases commenced on August 1, 2022, leaving \$70 million unutilized under the 2018 Authorization. In 2022, we repurchased \$4.23 billion of Caterpillar common stock, with \$12.8 billion remaining under the 2022 Authorization as of December 31, 2022. Caterpillar's basic shares outstanding as of December 31, 2022 were approximately 516 million.

Each quarter, our Board of Directors reviews the company's dividend for the applicable quarter. The Board evaluates the financial condition of the company and considers the economic outlook, corporate cash flow, the company's liquidity needs, and the health and stability of global credit markets to determine whether to maintain or change the quarterly dividend. In December 2022, the Board of Directors approved maintaining our quarterly dividend representing \$1.20 per share and we continue to expect our strong financial position to support the dividend. Dividends paid totaled \$2.44 billion in 2022.

Financial Products

Financial Products operating cash flow was \$1.52 billion in 2022, compared with \$1.42 billion in 2021. Net cash used for investing activities was \$356 million in 2022, compared with \$1.40 billion used in 2021. The change was primarily due to portfolio related activity partially offset by lower proceeds from disposal of equipment. Net cash used for financing activities was \$964 million in 2022, compared with net cash provided of \$257 million in 2021. The change was primarily due to lower portfolio funding requirements.

Off-balance sheet arrangements

We are a party to certain off-balance sheet arrangements, primarily in the form of guarantees. Information related to guarantees appears in Note 21 – “Guarantees and product warranty” of Part II, Item 8 “Financial Statements and Supplementary Data.”

RECENT ACCOUNTING PRONOUNCEMENTS

For a discussion of recent accounting pronouncements, see Note 1J — “New accounting guidance” of Part II, Item 8 “Financial Statements and Supplementary Data.”

CRITICAL ACCOUNTING ESTIMATES

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect reported amounts. The more significant estimates include: residual values for leased assets, fair values for goodwill impairment tests, warranty liability, reserves for product liability and insurance losses, postretirement benefits, post-sale discounts, credit losses and income taxes. We have incorporated many years of data into the determination of each of these estimates and we have not historically experienced significant adjustments. We review these assumptions at least annually with the Audit Committee of the Board of Directors. Following are the methods and assumptions used in determining our estimates and an indication of the risks inherent in each.

Residual values for leased assets – We determine the residual value of Cat Financial's leased equipment based on its estimated end-of-term market value. We estimate the residual value of leased equipment at the inception of the lease based on a number of factors, including historical wholesale market sales prices, past remarketing experience and any known significant market/product trends. We also consider the following critical factors in our residual value estimates: lease term, market size and demand, total expected hours of usage, machine configuration, application, location, model changes, quantities, third-party residual guarantees and contractual customer purchase options.

Upon termination of the lease, the equipment is either purchased by the lessee or sold to a third-party, in which case we may record a gain or a loss for the difference between the estimated residual value and the sale price.

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During the term of our leases, we monitor residual values. For operating leases, we record adjustments to depreciation expense reflecting changes in residual value estimates prospectively on a straight-line basis. For finance leases, we recognize residual value adjustments through a reduction of finance revenue over the remaining lease term.

We evaluate the carrying value of equipment on operating leases for potential impairment when we determine a triggering event has occurred. When a triggering event occurs, we perform a test for recoverability by comparing projected undiscounted future cash flows to the carrying value of the equipment on operating leases. If the test for recoverability identifies a possible impairment, we measure the fair value of the equipment on operating leases in accordance with the fair value measurement framework. We recognize an impairment charge for the amount by which the carrying value of the equipment on operating leases exceeds its estimated fair value.

At December 31, 2022, the aggregate residual value of equipment on operating leases was \$1.71 billion. Without consideration of other factors such as third-party residual guarantees or contractual customer purchase options, a 10 percent non-temporary decrease in the market value of our equipment subject to operating leases would reduce residual value estimates and result in the recognition of approximately \$80 million of additional annual depreciation expense.

Fair values for goodwill impairment tests – We test goodwill for impairment annually, at the reporting unit level, and whenever events or circumstances make it more likely than not that an impairment may have occurred, such as a significant adverse change in the business climate or a decision to sell all or a portion of a reporting unit. We perform our annual goodwill impairment test as of October 1 and monitor for interim triggering events on an ongoing basis.

We review goodwill for impairment utilizing either a qualitative assessment or a quantitative goodwill impairment test. If we choose to perform a qualitative assessment and determine the fair value more likely than not exceeds the carrying value, no further evaluation is necessary. For reporting units where we perform the quantitative goodwill impairment test, we compare the fair value of each reporting unit, which we primarily determine using an income approach based on the present value of discounted cash flows, to the respective carrying value, which includes goodwill. If the fair value of the reporting unit exceeds its carrying value, we do not consider the goodwill impaired. If the carrying value is higher than the fair value, we recognize the difference as an impairment loss.

For reporting units where we perform a quantitative goodwill impairment test, the process requires valuation of the respective reporting unit, which we primarily determine using an income approach based on a discounted five year forecasted cash flow with a year-five residual value. We compute the residual value using the constant growth method, which values the forecasted cash flows in perpetuity. The assumptions about future cash flows and growth rates are based on each reporting unit's long-term forecast and are subject to review and approval by senior management. A reporting unit's discount rate is a risk-adjusted weighted average cost of capital, which we believe approximates the rate from a market participant's perspective. The estimated fair value could be impacted by changes in market conditions, interest rates, growth rates, tax rates, costs, pricing and capital expenditures. We categorize the fair value determination as Level 3 in the fair value hierarchy due to its use of internal projections and unobservable measurement inputs.

Our annual impairment tests completed in the fourth quarter of 2022 indicated the fair value of each reporting unit was substantially above its respective carrying value, including goodwill, with the exception of our Rail reporting unit.

The Rail reporting unit is a part of our Energy & Transportation segment. Rail's product portfolio includes diesel-electric locomotives and other rail-related products and services. The annual impairment test completed in the fourth quarter of 2022 indicated that the fair value of Rail was below its carrying value. Accordingly, we recognized a goodwill impairment charge of \$925 million, resulting in a full impairment of Rail's goodwill balance as of October 1, 2022. There was a \$36 million tax benefit associated with this impairment charge. The valuation of the Rail reporting unit was based on estimates of future cash flows, which assumed a reduced demand forecast, lower margins due to continued inflationary cost pressures, and a discount rate approximately 140 basis points higher than utilized in the prior year valuation. The reduction in the demand forecast in the fourth quarter of 2022 was primarily driven by fourth quarter commercial developments, resulting in a lower outlook for the Company's locomotive offerings.

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An unfavorable change in our expectations for the financial performance of our reporting units, particularly long-term growth and profitability, would reduce the fair value of our reporting units. The demand for our equipment and related parts is highly cyclical and significantly impacted by commodity prices, although the impact may vary by reporting unit. The energy and mining industries are major users of our products, including the mineral extraction, oil and natural gas industries. Decisions to purchase our products are dependent upon the performance of those industries, which in turn are dependent in part on commodity prices. Lower commodity prices or industry specific circumstances that have a negative impact to the valuation assumptions may reduce the fair value of our reporting units. Should such events occur and it becomes more likely than not that a reporting unit's fair value has fallen below its carrying value, we will perform an interim goodwill impairment test(s), in addition to the annual impairment test. Future impairment tests may result in a goodwill impairment, depending on the outcome of the quantitative impairment test. We would report a goodwill impairment as a non-cash charge to earnings.

Warranty liability – At the time we recognize a sale, we record estimated future warranty costs. We determine the warranty liability by applying historical claim rate experience to the current field population and dealer inventory. Generally, we base historical claim rates on actual warranty experience for each product by machine model/engine size by customer or dealer location (inside or outside North America). We develop specific rates for each product shipment month and update them monthly based on actual warranty claim experience. Warranty costs may differ from those estimated if actual claim rates are higher or lower than our historical rates.

Product liability and insurance loss reserve – We determine these reserves based upon reported claims in process of settlement and actuarial estimates for losses incurred but not reported. Loss reserves, including incurred but not reported reserves, are based on estimates and ultimate settlements may vary significantly from such estimates due to increased claims frequency or severity over historical levels. The amount of these reserves totaled \$1.3 billion and \$1.2 billion at December 31, 2022 and 2021, respectively. The majority of the balance in both 2022 and 2021 consisted of unearned insurance premiums.

Postretirement benefits – We sponsor defined benefit pension plans and/or other postretirement benefit plans (retirement healthcare and life insurance) to employees in many of our locations throughout the world. There are assumptions used in the accounting for these defined benefit plans that include discount rate, expected return on plan assets, expected rate of compensation increase, the future health care trend rate, mortality and other economic and demographic assumptions. The actuarial assumptions we use may change or differ significantly from actual results, which may result in a material impact to our consolidated financial statements.

The effects of actual results differing from our assumptions and the effects of changing assumptions are considered actuarial gains or losses. We utilize a mark-to-market approach in recognizing actuarial gains or losses immediately through earnings upon the annual remeasurement in the fourth quarter, or on an interim basis as triggering events warrant remeasurement.

Primary actuarial assumptions were determined as follows:

- We use the assumed discount rate to discount future benefit obligations back to today's dollars. The U.S. discount rate is based on a benefit cash flow-matching approach and represents the rate at which our benefit obligations could effectively be settled as of our measurement date, December 31. The benefit cash flow-matching approach involves analyzing Caterpillar's projected cash flows against a high quality bond yield curve, calculated using a wide population of corporate Aa bonds available on the measurement date. We use a similar approach to determine the assumed discount rate for our most significant non-U.S. plans. In estimating the service and interest cost components of net periodic benefit cost, we utilize a full yield curve approach in determining a discount rate. This approach applies the specific spot rates along the yield curve used in the determination of the benefit obligation to the relevant projected cash flows. Discount rates are sensitive to changes in interest rates. A decrease in the discount rate would increase our obligation and expense.
- The expected long-term rate of return on plan assets is based on our estimate of long-term passive returns for equities and fixed income securities weighted by the allocation of our plan assets. Based on historical performance, we increase the passive returns due to our active management of the plan assets. This rate is impacted by changes in general market conditions, but because it represents a long-term rate, it is not significantly impacted by short-term market swings. Changes in our allocation of plan assets would also impact this rate. For example, a shift to more fixed income securities would lower the rate. A decrease in the rate would increase our expense. The expected return on plan assets is based on the fair value of plan asset allocations as of our measurement date, December 31.
- We use the expected rate of compensation increase to develop benefit obligations using projected pay at retirement. It represents average long-term salary increases. This rate is influenced by our long-term compensation policies. An increase in the rate would increase our obligation and expense.

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- The assumed health care trend rate represents the rate at which health care costs are assumed to increase and is based on historical and expected experience. Changes in our projections of future health care costs due to general economic conditions and those specific to health care (e.g., technology driven cost changes) will impact this trend rate. An increase in the trend rate would increase our obligation and expense.
- We use the mortality assumption to estimate the life expectancy of plan participants. An increase in the life expectancy of plan participants will result in an increase in our obligation and expense.

[Table of Contents](#)**Postretirement Benefit Plan Actuarial Assumptions Sensitivity**

The effects of a one percentage-point change in certain actuarial assumptions on 2022 pension and OPEB costs and obligations are as follows:

(Millions of dollars)	2022 Benefit Cost Increase (Decrease)		Year-end Benefit Obligation Increase (Decrease)	
	One percentage-point increase	One percentage-point decrease	One percentage-point increase	One percentage-point decrease
U.S. Pension Benefits: ¹				
Assumed discount rate	\$ 101	\$ (131)	\$ (1,151)	\$ 1,363
Expected long-term rate of return on plan assets	(167)	167	—	—
Non-U.S. Pension Benefits:				
Assumed discount rate	17	(24)	(311)	380
Expected rate of compensation increase	5	(4)	28	(22)
Expected long-term rate of return on plan assets	(41)	41	—	—
Other Postretirement Benefits:				
Assumed discount rate	9	(11)	(218)	254
Expected rate of compensation increase	—	—	1	(1)
Expected long-term rate of return on plan assets	(2)	2	—	—

¹ Effective December 31, 2019, all U.S. pension benefits were frozen, and accordingly the expected rate of compensation increase assumption is no longer applicable.

Actuarial Assumptions

	U.S. Pension Benefits			Non-U.S. Pension Benefits			Other Postretirement Benefits		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Weighted-average assumptions used to determine benefit obligation, end of year:									
Discount rate	5.4 %	2.8 %	2.4 %	4.3 %	1.8 %	1.4 %	5.4 %	2.7 %	2.3 %
Rate of compensation increase ¹	— %	— %	— %	2.3 %	2.0 %	2.0 %	4.0 %	4.0 %	4.0 %
Weighted-average assumptions used to determine net periodic benefit cost:									
Discount rate used to measure service cost ¹	— %	— %	— %	1.7 %	1.4 %	1.5 %	2.8 %	2.5 %	3.2 %
Discount rate used to measure interest cost	2.3 %	1.8 %	2.8 %	1.7 %	1.2 %	1.7 %	2.2 %	1.6 %	2.8 %
Expected rate of return on plan assets	4.0 %	4.2 %	5.1 %	3.1 %	2.9 %	3.3 %	6.9 %	6.5 %	7.0 %
Rate of compensation increase ¹	— %	— %	— %	2.0 %	2.0 %	2.0 %	4.0 %	4.0 %	4.0 %
Health care cost trend rates at year-end:									
Health care trend rate assumed for next year							6.5 %	5.6 %	5.8 %
Rate that the cost trend rate gradually declines to							4.7 %	5.0 %	5.0 %
Year that the cost trend rate reaches ultimate rate							2030	2025	2025

¹ Effective December 31, 2019, all U.S. pension benefits were frozen, and accordingly this assumption is no longer applicable.

See Note 12 - "Postemployment benefit plans" of Part II, Item 8 "Financial Statement and Supplemental Data" for further information regarding the accounting for postretirement benefits.

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Post-sale discount reserve – We provide discounts to dealers through merchandising programs. We have numerous programs that are designed to promote the sale of our products. The most common dealer programs provide a discount when the dealer sells a product to a targeted end user. The amount of accrued post-sale discounts was \$1.6 billion and \$1.4 billion at December 31, 2022 and 2021, respectively. The reserve represents discounts that we expect to pay on previously sold units and is reviewed at least quarterly. We adjust the reserve if discounts paid differ from those estimated. Historically, those adjustments have not been material.

Allowance for credit losses - The allowance for credit losses is management's estimate of expected losses over the life of our finance receivable portfolio calculated using loss forecast models that take into consideration historical credit loss experience, current economic conditions and forecasts and scenarios that capture country and industry-specific economic factors. In addition, we consider qualitative factors not able to be fully captured in our loss forecast models, including borrower-specific and company-specific factors. These qualitative factors are subjective and require a degree of management judgment.

We measure the allowance for credit losses on a collective (pool) basis when similar risk characteristics exist and on an individual basis when we determine that similar risk characteristics do not exist. We identify finance receivables for individual evaluation based on past due status and information available about the customer, such as financial statements, news reports and published credit ratings, as well as general information regarding industry trends and the economic environment in which our customers operate. The allowance for credit losses attributable to finance receivables that are individually evaluated is based on the present value of expected future cash flows discounted at the receivables' effective interest rate, the fair value of the collateral for collateral-dependent receivables or the observable market price of the receivable. In determining collateral value, we estimate the current fair market value of the collateral less selling costs. We also consider credit enhancements such as additional collateral and contractual third-party guarantees.

While management believes it has exercised prudent judgment and applied reasonable assumptions, there can be no assurance that in the future, changes in economic conditions or other factors would not cause changes in the financial health of our customers. If the financial health of our customers deteriorates, the timing and level of payments received could be impacted and therefore, could result in a change to our estimated losses.

Income taxes – We are subject to the income tax laws of the many jurisdictions in which we operate. These tax laws are complex, and the manner in which they apply to our facts is sometimes open to interpretation. In establishing the provision for income taxes, we must make judgments about the application of these inherently complex tax laws. Our income tax positions and analysis are based on currently enacted tax law. Future changes in tax law or related interpretations could significantly impact the provision for income taxes, the amount of taxes payable, and the deferred tax asset and liability balances. Changes in tax law are reflected in the period of enactment with related interpretations considered in the period received.

Despite our belief that our tax return positions are consistent with applicable tax laws, we believe that taxing authorities could challenge certain positions. Settlement of any challenge can result in no change, a complete disallowance, or some partial adjustment reached through negotiations or litigation. We record tax benefits for uncertain tax positions based upon management's evaluation of the information available at the reporting date. To be recognized in the financial statements, a tax benefit must be at least more likely than not of being sustained based on technical merits. The benefit for positions meeting the recognition threshold is measured as the largest benefit more likely than not of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. Significant judgment is required in making these determinations and adjustments to unrecognized tax benefits may be necessary to reflect actual taxes payable upon settlement. Adjustments related to positions impacting the effective tax rate affect the provision for income taxes. Adjustments related to positions impacting the timing of deductions impact deferred tax assets and liabilities.

Deferred tax assets generally represent tax benefits for tax deductions or credits available in future tax returns. Certain estimates and assumptions are required to determine whether it is more likely than not that all or some portion of the benefit of a deferred tax asset will not be realized. In making this assessment, management analyzes the trend of U.S. GAAP earnings and estimates the impact of future taxable income, reversing temporary differences and available prudent and feasible tax planning strategies. We give less weight in this analysis to mark-to-market adjustments to remeasure our pension and OPEB plans as we do not consider these adjustments indicative of ongoing earnings trends. Should a change in facts or circumstances lead to a change in judgment about the ultimate realizability of a deferred tax asset, we record or adjust the related valuation allowance in the period that the change in facts and circumstances occurs, along with a corresponding increase or decrease in the provision for income taxes.

Additional information related to income taxes is included in Note 6 - "Income taxes" of Part II, Item 8 "Financial statements and Supplementary Data."

[Table of Contents](#)**OTHER MATTERS**

Information related to legal proceedings appears in Note 22—Environmental and Legal Matters of Part II, Item 8 “Financial Statements and Supplementary Data.”

RETIREMENT BENEFITS

We recognize mark-to-market gains and losses immediately through earnings upon the remeasurement of our pension and OPEB plans. Mark-to-market gains and losses represent the effects of actual results differing from our assumptions and the effects of changing assumptions. Changes in discount rates and differences between the actual return on plan assets and the expected return on plan assets generally have the largest impact on mark-to-market gains and losses.

The table below summarizes the amounts of net periodic benefit cost recognized for 2022, 2021 and 2020, respectively, and includes expected cost for 2023.

(Millions of dollars)	2023			
	Expected	2022	2021	2020
U.S. Pension Benefits	\$ (33)	\$ (268)	\$ (388)	\$ (309)
Non-U.S. Pension Benefits	1	(10)	(19)	18
Other Postretirement Benefits	188	161	118	147
Mark-to-market loss (gain)	— ¹	(606)	(833)	383
Total net periodic benefit cost (benefit)	\$ 156	\$ (723)	\$ (1,122)	\$ 239

¹ Expected net periodic benefit cost (benefit) does not include an estimate for mark-to-market gains or losses.

- **Expected increase in expense in 2023 compared to 2022** - Excluding the impact of mark-to-market gains and losses, our net periodic benefit cost is expected to increase \$273 million in 2023. This expected increase is primarily due to higher interest cost in 2023 as a result of higher discount rates at year-end 2022 (U.S. pension plans discount rate for 2023 interest cost is 5.2 percent compared to 2.3 percent for 2022) which is partially offset by higher expected return on plan assets in 2023 (U.S. pension plans expected return on plans assets is 5.8 percent for 2023 compared to 4.0 percent in 2022).
- **Increase in expense in 2022 compared to 2021** - Primarily due to lower mark-to-market gains in 2022 compared to 2021 and higher interest cost in 2022 as a result of higher discount rates at year-end 2021.
- **Decrease in expense in 2021 compared to 2020** - Primarily due to mark-to-market gains in 2021 compared to mark-to-market losses in 2020 and lower interest cost in 2021 as a result of lower discount rates at year-end 2020.

The primary factors that resulted in mark-to-market losses (gains) for 2022, 2021 and 2020 are described below. We include the net mark-to-market losses (gains) in Other income (expense) in the Results of Operations.

- **2022 net mark-to-market gain of \$606 million** - Primarily due to higher discount rates at the end of 2022 compared to the end of 2021. This was partially offset by a lower actual return on plan assets compared to the expected return on plan assets (U.S. pension plans had an actual loss rate of (22.6) percent compared to an expected rate of return of 4.0 percent).
- **2021 net mark-to-market gain of \$833 million** - Primarily due to higher discount rates at the end of 2021 compared to the end of 2020. This was partially offset by various assumption changes and a lower actual return on plan assets compared to the expected return on plan assets (U.S. pension plans had an actual rate of return of 3.6 percent compared to an expected rate of return of 4.2 percent).
- **2020 net mark-to-market loss of \$383 million** - Primarily due to lower discount rates at the end of 2020 compared to the end of 2019. This was partially offset by a higher actual return on plan assets compared to the expected return on plan assets (U.S. pension plans had an actual rate of return of 16.7 percent compared to an expected rate of return of 5.1 percent).

[Table of Contents](#)**SENSITIVITY****Foreign Exchange Rate Sensitivity**

ME&T operations use foreign currency forward and option contracts to manage unmatched foreign currency cash inflow and outflow. Our objective is to minimize the risk of exchange rate movements that would reduce the U.S. dollar value of our foreign currency cash flow. Our policy allows for managing anticipated foreign currency cash flow for up to approximately five years. Based on the anticipated and firmly committed cash inflow and outflow for our ME&T operations for the next 12 months and the foreign currency derivative instruments in place at year-end, a hypothetical 10 percent weakening of the U.S. dollar relative to all other currencies would adversely affect our expected 2023 cash flow for our ME&T operations by approximately \$98 million. Last year similar assumptions and calculations yielded a potential \$89 million adverse impact on 2022 cash flow. We determine our net exposures by calculating the difference in cash inflow and outflow by currency and adding or subtracting outstanding foreign currency derivative instruments. We multiply these net amounts by 10 percent to determine the sensitivity.

In managing foreign currency risk for our Financial Products operations, our objective is to minimize earnings volatility resulting from conversion and the remeasurement of net foreign currency balance sheet positions and future transactions denominated in foreign currencies. Since our policy allows the use of foreign currency forward, option and cross currency contracts to offset the risk of currency mismatch between our assets and liabilities and exchange rate risk associated with future transactions denominated in foreign currencies, a 10 percent change in the value of the U.S. dollar relative to all other currencies would not have a material effect on our consolidated financial position, results of operations or cash flow. Neither our policy nor the effect of a 10 percent change in the value of the U.S. dollar has changed from that reported at the end of last year.

The effect of the hypothetical change in exchange rates ignores the effect this movement may have on other variables, including competitive risk. If it were possible to quantify this competitive impact, the results would probably be different from the sensitivity effects shown above. In addition, it is unlikely that all currencies would uniformly strengthen or weaken relative to the U.S. dollar. In reality, some currencies may weaken while others may strengthen. Our primary exposure (excluding competitive risk) is to exchange rate movements in the Australian dollar, Chinese yuan, Mexican peso, Indian rupee and Euro.

Interest Rate Sensitivity

For our ME&T operations, we have the option to use interest rate contracts to lower the cost of borrowed funds by attaching fixed-to-floating interest rate contracts to fixed-rate debt, and by entering into forward rate agreements on future debt issuances. A hypothetical 100 basis point adverse move in interest rates along the entire interest rate yield curve would have a minimal impact to the 2023 pre-tax earnings of ME&T. Last year, similar assumptions and calculations yielded a minimal impact to 2022 pre-tax earnings.

For our Financial Products operations, we use interest rate derivative instruments primarily to meet our match-funding objectives and strategies. We have a match-funding policy that addresses the interest rate risk by aligning the interest rate profile (fixed or floating rate and duration) of our debt portfolio with the interest rate profile of our finance receivable portfolio within a predetermined range on an ongoing basis. In connection with that policy, we use interest rate derivative instruments to modify the debt structure to match assets within the finance receivable portfolio. Match funding reduces the volatility of margins between interest-bearing assets and interest-bearing liabilities, regardless of which direction interest rates move.

In order to properly manage sensitivity to changes in interest rates, Financial Products measures the potential impact of different interest rate assumptions on pre-tax earnings. All on-balance sheet positions, including derivative financial instruments, are included in the analysis. The primary assumptions included in the analysis are that there are no new fixed rate assets or liabilities, the proportion of fixed rate debt to fixed rate assets remains unchanged and the level of floating rate assets and debt remain constant. An analysis of the December 31, 2022 balance sheet, using these assumptions, estimates the impact of a 100 basis point immediate and sustained adverse change in interest rates to have a minimal impact on 2023 pre-tax earnings. Last year, similar assumptions and calculations yielded a minimal impact to 2022 pre-tax earnings.

This analysis does not necessarily represent our current outlook of future market interest rate movement, nor does it consider any actions management could undertake in response to changes in interest rates. Accordingly, no assurance can be given that actual results would be consistent with the results of our estimate.

[Table of Contents](#)**NON-GAAP FINANCIAL MEASURES**

We provide the following definitions for the non-GAAP financial measures used in this report. These non-GAAP financial measures have no standardized meaning prescribed by U.S. GAAP and therefore are unlikely to be comparable to the calculation of similar measures for other companies. Management does not intend these items to be considered in isolation or as a substitute for the related GAAP measures.

We believe it is important to separately quantify the profit impact of three significant items in order for our results to be meaningful to our readers. These items consist of (i) goodwill impairment, (ii) restructuring costs and (iii) pension and OPEB mark-to-market (gains) losses resulting from plan remeasurements. We do not consider these items indicative of earnings from ongoing business activities and believe the non-GAAP measures will provide investors with useful perspective on underlying business results and trends and aid with assessing our period-over-period results. In addition, we provide a calculation of ME&T free cash flow as we believe it is an important measure for investors to determine the cash generation available for financing activities including debt repayments, dividends and share repurchases.

Reconciliations of adjusted results to the most directly comparable GAAP measures are as follows:

(Dollars in millions except per share data)	Operating Profit	Operating Profit Margin	Profit Before Taxes	Provision (Benefit) for Income Taxes	Effective Tax Rate	Profit	Profit per Share
Twelve Months Ended December 31, 2022 - U.S. GAAP	\$ 7,904	13.3 %	\$ 8,752	\$ 2,067	23.6 %	\$ 6,705	\$ 12.64
Goodwill impairment	925	1.6 %	925	36	3.9 %	889	1.68
Restructuring costs	299	0.5 %	299	72	24.0 %	227	0.43
Pension/OPEB mark-to-market (gains) losses	\$ —	— %	(606)	(124)	20.5 %	(482)	(0.91)
Twelve Months Ended December 31, 2022 - Adjusted	\$ 9,128	15.4 %	\$ 9,370	\$ 2,051	21.9 %	\$ 7,339	\$ 13.84
Twelve Months Ended December 31, 2021 - U.S. GAAP	\$ 6,878	13.5 %	\$ 8,204	\$ 1,742	21.2 %	\$ 6,489	\$ 11.83
Restructuring costs	90	0.2 %	90	4	4.4 %	86	0.15
Pension/OPEB mark-to-market (gains) losses	—	— %	(833)	(190)	22.8 %	(643)	(1.17)
Twelve Months Ended December 31, 2021 - Adjusted	\$ 6,968	13.7 %	\$ 7,461	\$ 1,556	20.9 %	\$ 5,932	\$ 10.81

Reconciliations of ME&T free cash flow to the most directly comparable GAAP measure, net cash provided by operating activities are as follows:

Millions of dollars	Twelve Months Ended December 31,	
	2022	2021
ME&T net cash provided by operating activities ¹	\$ 6,358	\$ 7,177
ME&T discretionary pension contributions	—	—
ME&T capital expenditures	(1,298)	(1,129)
Cash payments related to settlements with the U.S. Internal Revenue Service	717	—
ME&T free cash flow	\$ 5,777	\$ 6,048

¹ See reconciliation of ME&T net cash provided by operating activities to consolidated net cash provided by operating activities on page 53.

[Table of Contents](#)**Supplemental Consolidating Data**

We are providing supplemental consolidating data for the purpose of additional analysis. We have grouped the data as follows:

Consolidated – Caterpillar Inc. and its subsidiaries.

Machinery, Energy & Transportation – We define ME&T as it is presented in the supplemental data as Caterpillar Inc. and its subsidiaries, excluding Financial Products. ME&T's information relates to the design, manufacturing and marketing of our products.

Financial Products – We define Financial Products as it is presented in the supplemental data as our finance and insurance subsidiaries, primarily Caterpillar Financial Services Corporation (Cat Financial) and Cat Insurance Holdings Inc. (Insurance Services). Financial Products' information relates to the financing to customers and dealers for the purchase and lease of Caterpillar and other equipment.

Consolidating Adjustments – Eliminations of transactions between ME&T and Financial Products.

The nature of the ME&T and Financial Products businesses is different, especially with regard to the financial position and cash flow items. Caterpillar management utilizes this presentation internally to highlight these differences. We believe this presentation will assist readers in understanding our business.

Pages 51 to 53 reconcile ME&T and Financial Products to Caterpillar Inc. consolidated financial information. Certain amounts for prior periods have been reclassified to conform to current year presentation.

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**Supplemental Data for Results of Operations
For The Years Ended December 31**

(Millions of dollars)	Supplemental consolidating data											
	Consolidated			Machinery, Energy & Transportation			Financial Products			Consolidating Adjustments		
	2022	2021	2020	2022	2021	2020	2022	2021	2020	2022	2021	2020
Sales and revenues:												
Sales of Machinery, Energy & Transportation	\$56,574	\$48,188	\$39,022	\$56,574	\$48,188	\$39,022	\$—	\$—	\$—	\$—	\$—	\$—
Revenues of Financial Products	2,853	2,783	2,726	—	—	—	3,376	3,172	3,110	(523) ¹	(389) ¹	(384) ¹
Total sales and revenues	59,427	50,971	41,748	56,574	48,188	39,022	3,376	3,172	3,110	(523)	(389)	(384)
Operating costs:												
Cost of goods sold	41,350	35,513	29,082	41,356	35,521	29,088	—	—	—	(6) ²	(8) ²	(6) ²
Selling, general and administrative expenses	5,651	5,365	4,642	4,999	4,724	3,915	672	654	746	(20) ²	(13) ²	(19) ²
Research and development expenses	1,814	1,686	1,415	1,814	1,686	1,415	—	—	—	—	—	—
Interest expense of Financial Products	565	455	589	—	—	—	565	455	591	—	—	(2) ³
Goodwill impairment charge	925	—	—	925	—	—	—	—	—	—	—	—
Other operating (income) expenses	1,218	1,074	1,467	47	(106)	283	1,249	1,247	1,236	(78) ²	(67) ²	(52) ²
Total operating costs	51,523	44,093	37,195	49,141	41,825	34,701	2,486	2,356	2,573	(104)	(88)	(79)
Operating profit	7,904	6,878	4,553	7,433	6,363	4,321	890	816	537	(419)	(301)	(305)
Interest expense excluding Financial Products	443	488	514	444	488	513	—	—	—	(1) ³	—	1 ³
Other income (expense)	1,291	1,814	(44)	1,374	2,276	(62)	(26)	87	32	(57) ⁴	(549) ⁴	(14) ⁴
Consolidated profit before taxes	8,752	8,204	3,995	8,363	8,151	3,746	864	903	569	(475)	(850)	(320)
Provision (benefit) for income taxes	2,067	1,742	1,006	1,858	1,517	853	209	225	153	—	—	—
Profit of consolidated companies	6,685	6,462	2,989	6,505	6,634	2,893	655	678	416	(475)	(850)	(320)
Equity in profit (loss) of unconsolidated affiliated companies	19	31	14	26	42	29	—	—	—	(7) ⁵	(11) ⁵	(15) ⁵
Profit of consolidated and affiliated companies	6,704	6,493	3,003	6,531	6,676	2,922	655	678	416	(482)	(861)	(335)
Less: Profit (loss) attributable to noncontrolling interests	(1)	4	5	(1)	3	5	7	12	15	(7) ⁶	(11) ⁶	(15) ⁶
Profit⁷	\$ 6,705	\$ 6,489	\$ 2,998	\$ 6,532	\$ 6,673	\$ 2,917	\$ 648	\$ 666	\$ 401	\$ (475)	\$ (850)	\$ (320)

¹ Elimination of Financial Products' revenues earned from ME&T.² Elimination of net expenses recorded by ME&T paid to Financial Products.³ Elimination of interest expense recorded between Financial Products and ME&T.⁴ Elimination of discount recorded by ME&T on receivables sold to Financial Products and of interest earned between ME&T and Financial Products as well as dividends paid by Financial Products to ME&T.⁵ Elimination of equity profit (loss) earned from Financial Products' subsidiaries partially owned by ME&T subsidiaries.⁶ Elimination of noncontrolling interest profit (loss) recorded by Financial Products for subsidiaries partially owned by ME&T subsidiaries.⁷ Profit attributable to common shareholders.

[Table of Contents](#)**Supplemental Data for Financial Position****At December 31**

(Millions of dollars)	Supplemental consolidating data									
	Consolidated		Machinery, Energy & Transportation		Financial Products		Consolidating Adjustments			
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Assets										
Current assets:										
Cash and cash equivalents	\$ 7,004	\$ 9,254	\$ 6,042	\$ 8,428	\$ 962	\$ 826	\$ —	\$ —	\$ —	\$ —
Receivables - trade and other	8,856	8,477	3,710	3,279	519	435	4,627 ^{1,2}	4,763 ^{1,2}		
Receivables - finance	9,013	8,898	—	—	13,902	13,828	(4,889) ²	(4,930) ²		
Prepaid expenses and other current assets	2,642	2,788	2,488	2,567	290	358	(136) ³	(137) ³		
Inventories	16,270	14,038	16,270	14,038	—	—	—	—		
Total current assets	43,785	43,455	28,510	28,312	15,673	15,447	(398)	(304)		
Property, plant and equipment - net	12,028	12,090	8,186	8,172	3,842	3,918	—	—		
Long-term receivables - trade and other	1,265	1,204	418	375	339	204	508 ^{1,2}	625 ^{1,2}		
Long-term receivables - finance	12,013	12,707	—	—	12,552	13,358	(539) ²	(651) ²		
Noncurrent deferred and refundable income taxes	2,213	1,840	2,755	2,396	115	105	(657) ⁴	(661) ⁴		
Intangible assets	758	1,042	758	1,042	—	—	—	—		
Goodwill	5,288	6,324	5,288	6,324	—	—	—	—		
Other assets	4,593	4,131	3,882	3,388	1,892	1,952	(1,181) ⁵	(1,209) ⁵		
Total assets	\$ 81,943	\$ 82,793	\$ 49,797	\$ 50,009	\$ 34,413	\$ 34,984	\$ (2,267)	\$ (2,200)		
Liabilities										
Current liabilities:										
Short-term borrowings	\$ 5,957	\$ 5,404	\$ 3	\$ 9	\$ 5,954	\$ 5,395	\$ —	\$ —		
Accounts payable	8,689	8,154	8,657	8,079	294	242	(262) ⁶	(167) ⁶		
Accrued expenses	4,080	3,757	3,687	3,385	393	372	—	—		
Accrued wages, salaries and employee benefits	2,313	2,242	2,264	2,186	49	56	—	—		
Customer advances	1,860	1,087	1,860	1,086	—	1	—	—		
Dividends payable	620	595	620	595	—	—	—	—		
Other current liabilities	2,690	2,256	2,215	1,773	635	642	(160) ^{4,7}	(159) ^{4,7}		
Long-term debt due within one year	5,322	6,352	120	45	5,202	6,307	—	—		
Total current liabilities	31,531	29,847	19,426	17,158	12,527	13,015	(422)	(326)		
Long-term debt due after one year	25,714	26,033	9,529	9,772	16,216	16,287	(31) ⁸	(26) ⁸		
Liability for postemployment benefits	4,203	5,592	4,203	5,592	—	—	—	—		
Other liabilities	4,604	4,805	3,677	4,106	1,638	1,425	(711) ⁴	(726) ⁴		
Total liabilities	66,052	66,277	36,835	36,628	30,381	30,727	(1,164)	(1,078)		
Commitments and contingencies										
Shareholders' equity										
Common stock	6,560	6,398	6,560	6,398	905	919	(905) ⁹	(919) ⁹		
Treasury stock	(31,748)	(27,643)	(31,748)	(27,643)	—	—	—	—		
Profit employed in the business	43,514	39,282	39,435	35,390	4,068	3,881	11 ⁹	11 ⁹		
Accumulated other comprehensive income (loss)	(2,457)	(1,553)	(1,310)	(799)	(1,147)	(754)	—	—		
Noncontrolling interests	22	32	25	35	206	211	(209) ⁹	(214) ⁹		
Total shareholders' equity	15,891	16,516	12,962	13,381	4,032	4,257	(1,103)	(1,122)		
Total liabilities and shareholders' equity	\$ 81,943	\$ 82,793	\$ 49,797	\$ 50,009	\$ 34,413	\$ 34,984	\$ (2,267)	\$ (2,200)		

¹ Elimination of receivables between ME&T and Financial Products.² Reclassification of ME&T's trade receivables purchased by Financial Products and Financial Products' wholesale inventory receivables.³ Elimination of ME&T's insurance premiums that are prepaid to Financial Products.⁴ Reclassification reflecting required netting of deferred tax assets/liabilities by taxing jurisdiction.⁵ Elimination of other intercompany assets between ME&T and Financial Products.⁶ Elimination of payables between ME&T and Financial Products.⁷ Elimination of prepaid insurance in Financial Products' other liabilities.⁸ Elimination of debt between ME&T and Financial Products.⁹ Eliminations associated with ME&T's investments in Financial Products' subsidiaries.

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**Supplemental Data for Statement of Cash Flow
For the Years Ended December 31**

(Millions of dollars)	Supplemental consolidating data							
	Consolidated		Machinery, Energy & Transportation		Financial Products		Consolidating Adjustments	
	2022	2021	2022	2021	2022	2021	2022	2021
Cash flow from operating activities:								
Profit (loss) of consolidated and affiliated companies	\$ 6,704	\$ 6,493	\$ 6,531	\$ 6,676	\$ 655	\$ 678	\$ (482) ^{1,5}	\$ (861) ^{1,5}
Adjustments for non-cash items:								
Depreciation and amortization	2,219	2,352	1,439	1,550	780	802	—	—
Actuarial (gain) loss on pension and postretirement benefits	(606)	(833)	(606)	(833)	—	—	—	—
Provision (benefit) for deferred income taxes	(377)	(383)	(368)	(329)	(9)	(54)	—	—
Goodwill impairment charge	925	—	925	—	—	—	—	—
Other	701	216	452	131	(205)	(209)	454 ²	294 ²
Changes in assets and liabilities, net of acquisitions and divestitures:								
Receivables - trade and other	(220)	(1,259)	(390)	(463)	143	47	27 ^{2,3}	(843) ^{2,3}
Inventories	(2,589)	(2,586)	(2,572)	(2,581)	—	—	(17) ²	(5) ²
Accounts payable	798	2,041	811	2,015	82	49	(95) ²	(23) ²
Accrued expenses	317	196	274	288	43	(92)	—	—
Accrued wages, salaries and employee benefits	90	1,107	97	1,066	(7)	41	—	—
Customer advances	768	34	769	33	(1)	1	—	—
Other assets—net	(210)	(97)	(183)	(200)	(35)	25	8 ²	78 ²
Other liabilities—net	(754)	(83)	(821)	(176)	71	132	(4) ²	(39) ²
Net cash provided by (used for) operating activities	7,766	7,198	6,358	7,177	1,517	1,420	(109)	(1,399)
Cash flow from investing activities:								
Capital expenditures—excluding equipment leased to others	(1,296)	(1,093)	(1,279)	(1,088)	(20)	(16)	3 ²	11 ²
Expenditures for equipment leased to others	(1,303)	(1,379)	(19)	(41)	(1,310)	(1,347)	26 ²	9 ²
Proceeds from disposals of leased assets and property, plant and equipment	830	1,265	78	186	764	1,095	(12) ²	(16) ²
Additions to finance receivables	(13,239)	(13,002)	—	—	(14,223)	(13,845)	984 ³	843 ³
Collections of finance receivables	13,177	12,430	—	—	14,052	13,337	(875) ³	(907) ³
Net intercompany purchased receivables	—	—	—	—	492	(609)	(492) ³	609 ³
Proceeds from sale of finance receivables	57	51	—	—	57	51	—	—
Net intercompany borrowings	—	—	—	1,000	9	5	(9) ⁴	(1,005) ⁴
Investments and acquisitions (net of cash acquired)	(88)	(490)	(88)	(490)	—	—	—	—
Proceeds from sale of businesses and investments (net of cash sold)	1	36	1	36	—	—	—	—
Proceeds from sale of securities	2,383	785	1,948	274	435	511	—	—
Investments in securities	(3,077)	(1,766)	(2,549)	(1,189)	(528)	(577)	—	—
Other—net	14	79	98	81	(84)	(2)	—	—
Net cash provided by (used for) investing activities	(2,541)	(3,084)	(1,810)	(1,231)	(356)	(1,397)	(375)	(456)
Cash flow from financing activities:								
Dividends paid	(2,440)	(2,332)	(2,440)	(2,332)	(475)	(850)	475 ⁵	850 ⁵
Common stock issued, including treasury shares reissued	51	135	51	135	—	—	—	—
Common shares repurchased	(4,230)	(2,668)	(4,230)	(2,668)	—	—	—	—
Net intercompany borrowings	—	—	(9)	(5)	—	(1,000)	9 ⁴	1,005 ⁴
Proceeds from debt issued (original maturities greater than three months)	6,674	6,989	—	494	6,674	6,495	—	—
Payments on debt (original maturities greater than three months)	(7,728)	(9,796)	(25)	(1,919)	(7,703)	(7,877)	—	—
Short-term borrowings - net (original maturities three months or less)	402	3,488	(138)	(1)	540	3,489	—	—
Other—net	(10)	(4)	(10)	(4)	—	—	—	—
Net cash provided by (used for) financing activities	(7,281)	(4,188)	(6,801)	(6,300)	(964)	257	484	1,855
Effect of exchange rate changes on cash	(194)	(29)	(131)	(35)	(63)	6	—	—
Increase (decrease) in cash, cash equivalents and restricted cash	(2,250)	(103)	(2,384)	(389)	134	286	—	—
Cash, cash equivalents and restricted cash at beginning of period	9,263	9,366	8,433	8,822	830	544	—	—
Cash, cash equivalents and restricted cash at end of period	\$ 7,013	\$ 9,263	\$ 6,049	\$ 8,433	\$ 964	\$ 830	\$ —	\$ —

¹ Elimination of equity profit earned from Financial Products' subsidiaries partially owned by ME&T subsidiaries.² Elimination of non-cash adjustments and changes in assets and liabilities related to consolidated reporting.³ Reclassification of Financial Products' cash flow activity from investing to operating for receivables that arose from the sale of inventory.⁴ Elimination of net proceeds and payments to/from ME&T and Financial Products.⁵ Elimination of dividend activity between Financial Products and ME&T.

[Table of Contents](#)**Item 7A. Quantitative and Qualitative Disclosures About Market Risk.**

Information required by Item 7A appears in Note 1 — “Operations and summary of significant accounting policies,” Note 4 — “Derivative financial instruments and risk management,” Note 18 — “Fair value disclosures” and Note 19 — “Concentration of credit risk” of Part II, Item 8 “Financial Statements and Supplementary Data.” Other information required by Item 7A is included in Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

[Table of Contents](#)**Item 8. Financial Statements and Supplementary Data.****MANAGEMENT'S REPORT ON
INTERNAL CONTROL OVER FINANCIAL REPORTING**

The management of Caterpillar Inc. (company) is responsible for establishing and maintaining adequate internal control over financial reporting as such term is defined in Rule 13a-15(f) under the Exchange Act. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Our 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.

Management assessed the effectiveness of the company's internal control over financial reporting as of December 31, 2022. In making this assessment, 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 our assessment we concluded that, as of December 31, 2022, the company's internal control over financial reporting was effective based on those criteria.

The effectiveness of the company's internal control over financial reporting as of December 31, 2022 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm. Their report appears on pages 56-57.

/s/ D. James Umpleby III

D. James Umpleby III
Chief Executive Officer

/s/ Andrew R.J. Bonfield

Andrew R.J. Bonfield
Chief Financial Officer

February 15, 2023

[Table of Contents](#)**REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

To the Board of Directors and Shareholders of Caterpillar Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated statement of financial position of Caterpillar Inc. and its subsidiaries (the "Company") as of December 31, 2022 and 2021, and the related consolidated statements of results of operations, of comprehensive income (loss), of changes in shareholders' equity and of cash flow for each of the three years in the period ended December 31, 2022, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2022, 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, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022 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, 2022, 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's Report on 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.

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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.

Caterpillar SARL (“CSARL”) Internal Revenue Services (“IRS”) Settlement

As described in Note 6 to the consolidated financial statements, on September 8, 2022, management reached a settlement with the IRS that resolved all issues for tax years 2007 through 2016, without any penalties. The Company's settlement includes, among other issues, the resolution of disputed tax treatment of profits earned by CSARL from certain parts transactions. The IRS previously proposed increases to tax and imposition of accuracy related penalties based on application of the “substance-over-form” or “assignment-of-income” judicial doctrines, but the settlement did not include any increases to tax in the United States based on the judicial doctrines and does not include any penalties. The final tax assessed by the IRS for all issues under the settlement was \$490 million for the ten-year period. This amount was primarily paid in 2022 along with associated interest of \$250 million. As a result of the settlement, the Company recorded a discrete tax benefit of \$41 million within the provision (benefit) for income taxes of \$2,067 million for the year ended December 31, 2022.

The principal considerations for our determination that performing procedures relating to the CSARL IRS settlement is a critical audit matter are (i) the significant judgment by management in evaluating the impact of the settlement on income taxes; (ii) a high degree of auditor judgment, subjectivity and effort in performing procedures and evaluating audit evidence relating to the settlement; 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 income taxes. These procedures also included, among others (i) reading the settlement documents; (ii) evaluating management's process for determining the impact of the settlement to tax years 2007-2016; and (iii) evaluating management's assessment of other impacts of the settlement, including the amount of interest owed to the IRS. Professionals with specialized skill and knowledge were used to assist in evaluating the applicable tax laws and judicial doctrines related to the settlement, as well as changes in relevant tax regulations, rulings, and case law.

/s/ PricewaterhouseCoopers LLP
Chicago, Illinois
February 15, 2023

We have served as the Company's auditor since 1925.

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STATEMENT 1 Consolidated Results of Operations for the Years Ended December 31 (Dollars in millions except per share data)		Caterpillar Inc.		
		2022	2021	2020
Sales and revenues:				
Sales of Machinery, Energy & Transportation	\$ 56,574	\$ 48,188	\$ 39,022	
Revenues of Financial Products	2,853	2,783	2,726	
Total sales and revenues	59,427	50,971	41,748	
Operating costs:				
Cost of goods sold	41,350	35,513	29,082	
Selling, general and administrative expenses	5,651	5,365	4,642	
Research and development expenses	1,814	1,686	1,415	
Interest expense of Financial Products	565	455	589	
Goodwill impairment charge	925	—	—	
Other operating (income) expenses	1,218	1,074	1,467	
Total operating costs	51,523	44,093	37,195	
Operating profit		7,904	6,878	4,553
Interest expense excluding Financial Products	443	488	514	
Other income (expense)	1,291	1,814	(44)	
Consolidated profit before taxes		8,752	8,204	3,995
Provision (benefit) for income taxes	2,067	1,742	1,006	
Profit of consolidated companies	6,685	6,462	2,989	
Equity in profit (loss) of unconsolidated affiliated companies	19	31	14	
Profit of consolidated and affiliated companies		6,704	6,493	3,003
Less: Profit (loss) attributable to noncontrolling interests		(1)	4	5
Profit¹		\$ 6,705	\$ 6,489	\$ 2,998
Profit per common share	\$ 12.72	\$ 11.93	\$ 5.51	
Profit per common share — diluted²	\$ 12.64	\$ 11.83	\$ 5.46	
Weighted-average common shares outstanding (millions)				
- Basic	526.9	544.0	544.1	
- Diluted ²	530.4	548.5	548.6	

¹ Profit attributable to common shareholders.² Diluted by assumed exercise of stock-based compensation awards using the treasury stock method.**See accompanying notes to Consolidated Financial Statements.**

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STATEMENT 2 Consolidated Comprehensive Income (Loss) for the Years Ended December 31 (Millions of dollars)	Caterpillar Inc.		
	2022	2021	2020
Profit (loss) of consolidated and affiliated companies	\$ 6,704	\$ 6,493	\$ 3,003
Other comprehensive income (loss), net of tax (Note 17):			
Foreign currency translation:	(820)	(598)	577
Pension and other postretirement benefits:	23	(30)	(29)
Derivative financial instruments:	31	(3)	97
Available-for-sale securities:	(138)	(34)	34
Total other comprehensive income (loss), net of tax	(904)	(665)	679
Comprehensive income (loss)	5,800	5,828	3,682
Less: comprehensive income attributable to the noncontrolling interests	(1)	4	5
Comprehensive income (loss) attributable to shareholders	\$ 5,801	\$ 5,824	\$ 3,677

See accompanying notes to Consolidated Financial Statements.

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STATEMENT 3 **Caterpillar Inc.**
Consolidated Financial Position at December 31
(Dollars in millions)

	2022	2021
Assets		
Current assets:		
Cash and cash equivalents	\$ 7,004	\$ 9,254
Receivables – trade and other	8,856	8,477
Receivables – finance	9,013	8,898
Prepaid expenses and other current assets	2,642	2,788
Inventories	<u>16,270</u>	14,038
Total current assets	<u>43,785</u>	43,455
Property, plant and equipment – net	12,028	12,090
Long-term receivables – trade and other	1,265	1,204
Long-term receivables – finance	12,013	12,707
Noncurrent deferred and refundable income taxes	2,213	1,840
Intangible assets	758	1,042
Goodwill	5,288	6,324
Other assets	<u>4,593</u>	4,131
Total assets	\$ 81,943	\$ 82,793
Liabilities		
Current liabilities:		
Short-term borrowings:		
Machinery, Energy & Transportation	\$ 3	\$ 9
Financial Products	5,954	5,395
Accounts payable	8,689	8,154
Accrued expenses	4,080	3,757
Accrued wages, salaries and employee benefits	2,313	2,242
Customer advances	1,860	1,087
Dividends payable	620	595
Other current liabilities	<u>2,690</u>	2,256
Long-term debt due within one year:		
Machinery, Energy & Transportation	120	45
Financial Products	<u>5,202</u>	6,307
Total current liabilities	<u>31,531</u>	29,847
Long-term debt due after one year:		
Machinery, Energy & Transportation	9,498	9,746
Financial Products	16,216	16,287
Liability for postemployment benefits	4,203	5,592
Other liabilities	<u>4,604</u>	4,805
Total liabilities	<u>66,052</u>	<u>66,277</u>
Commitments and contingencies (Notes 21 and 22)		
Shareholders' equity		
Common stock of \$1.00 par value:		
Authorized shares: 2,000,000,000		
Issued shares: (2022 and 2021 – 814,894,624 shares) at paid-in amount	6,560	6,398
Treasury stock: (2022 - 298,549,134 shares; and 2021 - 279,006,573 shares) at cost	(31,748)	(27,643)
Profit employed in the business	43,514	39,282
Accumulated other comprehensive income (loss)	(2,457)	(1,553)
Noncontrolling interests	<u>22</u>	32
Total shareholders' equity	<u>15,891</u>	<u>16,516</u>
Total liabilities and shareholders' equity	<u>\$ 81,943</u>	<u>\$ 82,793</u>

See accompanying notes to Consolidated Financial Statements.

[Table of Contents](#)**STATEMENT 4****Caterpillar Inc.****Changes in Consolidated Shareholders' Equity for the Years Ended December 31
(Dollars in millions)**

	Common stock	Treasury stock	Profit employed in the business	Accumulated other comprehensive income (loss)	Noncontrolling interests	Total
Balance at December 31, 2019	\$ 5,935	\$ (24,217)	\$ 34,437	\$ (1,567)	\$ 41	\$ 14,629
Adjustments to adopt new accounting guidance						
Credit losses	—	—	(25)	—	—	(25)
Balance at January 1, 2020	\$ 5,935	\$ (24,217)	\$ 34,412	\$ (1,567)	\$ 41	\$ 14,604
Profit (loss) of consolidated and affiliated companies	—	—	2,998	—	5	3,003
Foreign currency translation, net of tax	—	—	—	577	—	577
Pension and other postretirement benefits, net of tax	—	—	—	(29)	—	(29)
Derivative financial instruments, net of tax	—	—	—	97	—	97
Available-for-sale securities, net of tax	—	—	—	34	—	34
Dividends declared	—	—	(2,247)	—	—	(2,247)
Distribution to noncontrolling interests	—	—	—	—	—	—
Common shares issued from treasury stock for stock-based compensation: 5,317,243	(61)	290	—	—	—	229
Stock-based compensation expense	202	—	—	—	—	202
Common shares repurchased: 10,096,006	—	(1,250)	—	—	—	(1,250)
Other	154	(1)	4	—	1	158
Balance at December 31, 2020	\$ 6,230	\$ (25,178)	\$ 35,167	\$ (888)	\$ 47	\$ 15,378
Profit (loss) of consolidated and affiliated companies	—	—	6,489	—	4	6,493
Foreign currency translation, net of tax	—	—	—	(598)	—	(598)
Pension and other postretirement benefits, net of tax	—	—	—	(30)	—	(30)
Derivative financial instruments, net of tax	—	—	—	(3)	—	(3)
Available-for-sale securities, net of tax	—	—	—	(34)	—	(34)
Change in ownership from noncontrolling interests	—	—	—	—	(14)	(14)
Dividends declared	—	—	(2,374)	—	—	(2,374)
Distribution to noncontrolling interests	—	—	—	—	(4)	(4)
Common shares issued from treasury stock for stock-based compensation: 3,571,503	(68)	203	—	—	—	135
Stock-based compensation expense	200	—	—	—	—	200
Common shares repurchased: 12,987,299	—	(2,668)	—	—	—	(2,668)
Other	36	—	—	—	(1)	35
Balance at December 31, 2021	\$ 6,398	\$ (27,643)	\$ 39,282	\$ (1,553)	\$ 32	\$ 16,516

(Continued)

[Table of Contents](#)**STATEMENT 4****Caterpillar Inc.****Changes in Consolidated Shareholders' Equity for the Years Ended December 31
(Dollars in millions)**

	Common stock	Treasury stock	Profit employed in the business	Accumulated other comprehensive income (loss)	Noncontrolling interests	Total
Balance at December 31, 2021	\$ 6,398	\$ (27,643)	\$ 39,282	\$ (1,553)	\$ 32	\$ 16,516
Profit (loss) of consolidated and affiliated companies	—	—	6,705	—	(1)	6,704
Foreign currency translation, net of tax	—	—	—	(820)	—	(820)
Pension and other postretirement benefits, net of tax	—	—	—	23	—	23
Derivative financial instruments, net of tax	—	—	—	31	—	31
Available-for-sale securities, net of tax	—	—	—	(138)	—	(138)
Change in ownership from noncontrolling interests	—	—	—	—	—	—
Dividends declared ¹	—	—	(2,473)	—	—	(2,473)
Distribution to noncontrolling interests	—	—	—	—	(10)	(10)
Common shares issued from treasury stock for stock-based compensation: 2,340,887	(74)	125	—	—	—	51
Stock-based compensation expense	193	—	—	—	—	193
Common shares repurchased: 21,882,818 ²	—	(4,230)	—	—	—	(4,230)
Other	43	—	—	—	1	44
Balance at December 31, 2022	\$ 6,560	\$ (31,748)	\$ 43,514	\$ (2,457)	\$ 22	\$ 15,891

¹ Dividends per share of common stock of \$4.71, \$4.36 and \$4.12 were declared in the years ended December 31, 2022, 2021 and 2020, respectively.² See Note 16 regarding shares repurchased.**See accompanying notes to Consolidated Financial Statements.**

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STATEMENT 5 **Caterpillar Inc.**
Consolidated Statement of Cash Flow for the Years Ended December 31
(Millions of dollars)

	2022	2021	2020
Cash flow from operating activities:			
Profit (loss) of consolidated and affiliated companies	\$ 6,704	\$ 6,493	\$ 3,003
Adjustments for non-cash items:			
Depreciation and amortization	2,219	2,352	2,432
Actuarial (gain) loss on pension and postretirement benefits	(606)	(833)	383
Provision (benefit) for deferred income taxes	(377)	(383)	(74)
Goodwill impairment charge	925	—	—
Other	701	216	1,000
Changes in assets and liabilities, net of acquisitions and divestitures:			
Receivables – trade and other	(220)	(1,259)	1,442
Inventories	(2,589)	(2,586)	(34)
Accounts payable	798	2,041	98
Accrued expenses	317	196	(366)
Accrued wages, salaries and employee benefits	90	1,107	(544)
Customer advances	768	34	(126)
Other assets – net	(210)	(97)	(201)
Other liabilities – net	(754)	(83)	(686)
Net cash provided by (used for) operating activities	7,766	7,198	6,327
Cash flow from investing activities:			
Capital expenditures – excluding equipment leased to others	(1,296)	(1,093)	(978)
Expenditures for equipment leased to others	(1,303)	(1,379)	(1,137)
Proceeds from disposals of leased assets and property, plant and equipment	830	1,265	772
Additions to finance receivables	(13,239)	(13,002)	(12,385)
Collections of finance receivables	13,177	12,430	12,646
Proceeds from sale of finance receivables	57	51	42
Investments and acquisitions (net of cash acquired)	(88)	(490)	(111)
Proceeds from sale of businesses and investments (net of cash sold)	1	36	25
Proceeds from sale of securities	2,383	785	345
Investments in securities	(3,077)	(1,766)	(638)
Other – net	14	79	(66)
Net cash provided by (used for) investing activities	(2,541)	(3,084)	(1,485)
Cash flow from financing activities:			
Dividends paid	(2,440)	(2,332)	(2,243)
Common stock issued, including treasury shares reissued	51	135	229
Common shares repurchased	(4,230)	(2,668)	(1,130)
Proceeds from debt issued (original maturities greater than three months):			
- Machinery, Energy & Transportation	—	494	1,991
- Financial Products	6,674	6,495	8,440
Payments on debt (original maturities greater than three months):			
- Machinery, Energy & Transportation	(25)	(1,919)	(26)
- Financial Products	(7,703)	(7,877)	(8,211)
Short-term borrowings – net (original maturities three months or less)	402	3,488	(2,804)
Other – net	(10)	(4)	(1)
Net cash provided by (used for) financing activities	(7,281)	(4,188)	(3,755)
Effect of exchange rate changes on cash	(194)	(29)	(13)
Increase (decrease) in cash, cash equivalents and restricted cash	(2,250)	(103)	1,074
Cash, cash equivalents and restricted cash at beginning of period	9,263	9,366	8,292
Cash, cash equivalents and restricted cash at end of period	\$ 7,013	\$ 9,263	\$ 9,366

Cash equivalents primarily represent short-term, highly liquid investments with original maturities of generally three months or less.

See accompanying notes to Consolidated Financial Statements.

[Table of Contents](#)**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS****1. Operations and summary of significant accounting policies****A. Nature of operations**

Information in our financial statements and related commentary are presented in the following categories:

Machinery, Energy & Transportation (ME&T) – We define ME&T as Caterpillar Inc. and its subsidiaries, excluding Financial Products. ME&T's information relates to the design, manufacturing and marketing of our products.

Financial Products – We define Financial Products as our finance and insurance subsidiaries, primarily Caterpillar Financial Services Corporation (Cat Financial) and Caterpillar Insurance Holdings Inc. (Insurance Services). Financial Products' information relates to the financing to customers and dealers for the purchase and lease of Caterpillar and other equipment.

We sell our products primarily under the brands "Caterpillar," "CAT," design versions of "CAT" and "Caterpillar," "EMD," "FG Wilson," "MaK," "MWM," "Perkins," "Progress Rail," "SEM" and "Solar Turbines."

We conduct operations in our ME&T line of business under highly competitive conditions, including intense price competition. We place great emphasis on the high quality and performance of our products and our dealers' service support. Although no one competitor is believed to produce all of the same types of equipment that we do, there are numerous companies, large and small, which compete with us in the sale of each of our products.

We distribute our machines principally through a worldwide organization of dealers (dealer network), 43 located in the United States and 113 located outside the United States, serving 192 countries. We sell reciprocating engines principally through the dealer network and to other manufacturers for use in products. We also sell some of the reciprocating engines manufactured by our subsidiary Perkins Engines Company Limited through its worldwide network of 88 distributors covering 185 countries. We sell the FG Wilson branded electric power generation systems through its worldwide network of 110 distributors covering 109 countries. We also sell some of the large, medium speed reciprocating engines under the MaK brand through a worldwide network of 20 distributors covering 130 countries. Our dealers do not deal exclusively with our products; however, in most cases sales and servicing of our products are the dealers' principal business. We sell some products, primarily turbines and locomotives, to end customers through sales forces employed by the company. At times, these employees are assisted by independent sales representatives.

The Financial Products line of business also conducts operations under highly competitive conditions. Financing for users of Caterpillar products is available through a variety of competitive sources, principally commercial banks and finance and leasing companies. We offer various financing, insurance and risk management products designed to support sales of our products and generate financing income for our company. We conduct a significant portion of Financial Products activity in North America, with additional offices in Latin America, Asia/Pacific, Europe, Africa and the Middle East.

B. Basis of presentation

The consolidated financial statements include the accounts of Caterpillar Inc. and its subsidiaries where we have a controlling financial interest.

Investments in companies where our ownership exceeds 20 percent and we do not have a controlling interest or where the ownership is less than 20 percent and for which we have a significant influence are accounted for by the equity method.

We consolidate all variable interest entities (VIEs) where Caterpillar Inc. is the primary beneficiary. For VIEs, we assess whether we are the primary beneficiary as prescribed by the accounting guidance on the consolidation of VIEs. The primary beneficiary of a VIE is the party that has both the power to direct the activities that most significantly impact the entity's economic performance and the obligation to absorb losses or the right to receive benefits that could potentially be significant to the VIE. See Note 21 for further discussion on a consolidated VIE.

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Cat Financial has end-user customers and dealers that are VIEs of which we are not the primary beneficiary. Our maximum exposure to loss from our involvement with these VIEs is limited to the credit risk inherently present in the financial support that we have provided. Credit risk was evaluated and reflected in our financial statements as part of our overall portfolio of finance receivables and related allowance for credit losses.

We include shipping and handling costs in Cost of goods sold in Statement 1. Other operating (income) expenses primarily include Cat Financial's depreciation on equipment leased to others, Insurance Services' underwriting expenses, (gains) losses on disposal of long-lived assets, long-lived asset impairment charges, legal settlements and accruals, contract termination costs and employee separation charges.

Prepaid expenses and other current assets in Statement 3 primarily include investments in debt and equity securities, prepaid insurance, contract assets, right of return assets, prepaid and refundable income taxes, assets held for sale, core to be returned for remanufacturing, restricted cash and other short-term investments.

Certain amounts for prior years have been reclassified to conform with the current-year financial statement presentation.

C. Inventories

We state inventories at the lower of cost or net realizable value. We principally determine cost using the last-in, first-out (LIFO) method. The value of inventories on the LIFO basis represented about 65 percent and 60 percent of total inventories at December 31, 2022 and 2021, respectively.

If the FIFO (first-in, first-out) method had been in use, inventories would have been \$3,321 million and \$2,599 million higher than reported at December 31, 2022 and 2021, respectively.

D. Depreciation and amortization

We compute depreciation of plant and equipment principally using accelerated methods. We compute depreciation on equipment leased to others, primarily for Financial Products, using the straight-line method over the term of the lease. The depreciable basis is the original cost of the equipment less the estimated residual value of the equipment at the end of the lease term. In 2022, 2021 and 2020, Cat Financial depreciation on equipment leased to others was \$718 million, \$755 million and \$758 million, respectively, which we include in Other operating (income) expenses in Statement 1. In 2022, 2021 and 2020, consolidated depreciation expense was \$1,937 million, \$2,050 million and \$2,122 million, respectively. We compute amortization of purchased finite-lived intangibles principally using the straight-line method, generally not to exceed a period of 20 years.

E. Foreign currency translation

The functional currency for most of our ME&T consolidated subsidiaries is the U.S. dollar. The functional currency for most of our Financial Products consolidated subsidiaries is the respective local currency. We include gains and losses resulting from the remeasurement of foreign currency amounts to the functional currency in Other income (expense) in Statement 1. We include gains and losses resulting from translating assets and liabilities from the functional currency to U.S. dollars in Accumulated other comprehensive income (loss) (AOCI) in Statement 3.

F. Derivative financial instruments

Our earnings and cash flow are subject to fluctuations due to changes in foreign currency exchange rates, interest rates and commodity prices. Our Risk Management Policy (policy) allows for the use of derivative financial instruments to prudently manage foreign currency exchange rate, interest rate and commodity price exposures. Our policy specifies that derivatives are not to be used for speculative purposes. Derivatives that we use are primarily foreign currency forward, option and cross currency contracts, interest rate contracts and commodity forward and option contracts. All derivatives are recorded at fair value. See Note 4 for more information.

G. Income taxes

We determine the provision for income taxes using the asset and liability approach taking into account guidance related to uncertain tax positions. Tax laws require items to be included in tax filings at different times than the items are reflected in the financial statements. We recognize a current liability for the estimated taxes payable for the current year. Deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid. We adjust deferred taxes for enacted changes in tax rates and tax laws. We record valuation allowances to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized. See Note 6 for further discussion.

H. Goodwill

For acquisitions accounted for as a business combination, goodwill represents the excess of the cost over the fair value of the net assets acquired. We are required to test goodwill for impairment, at the reporting unit level, annually and when events or circumstances make it more likely than not that an impairment may have occurred. A reporting unit is an operating segment or one level below an operating segment (referred to as a component) to which goodwill is assigned when initially recorded. We assign goodwill to reporting units based on our integration plans and the expected synergies resulting from the acquisition. Because Caterpillar is a highly integrated company, the businesses we acquire are sometimes combined with or integrated into existing reporting units. When changes occur in the composition of our operating segments or reporting units, we reassess goodwill to the affected reporting units based on their relative fair values.

We perform our annual goodwill impairment test as of October 1 and monitor for interim triggering events on an ongoing basis. We review goodwill for impairment utilizing either a qualitative assessment or a quantitative goodwill impairment test. If we choose to perform a qualitative assessment and determine the fair value more likely than not exceeds the carrying value, no further evaluation is necessary. For reporting units where we perform the quantitative goodwill impairment test, we compare the fair value of each reporting unit, which we primarily determine using an income approach based on the present value of discounted cash flows, to the respective carrying value, which includes goodwill. If the fair value of the reporting unit exceeds its carrying value, we do not consider the goodwill impaired. If the carrying value is higher than the fair value, we would recognize the difference as an impairment loss. See Note 10 for further details.

I. Estimates in financial statements

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect reported amounts. The more significant estimates include: residual values for leased assets; fair values for goodwill impairment tests; warranty liability and reserves for product liability and insurance losses, postretirement benefits, post-sale discounts, credit losses and income taxes.

J. New accounting guidance

A. Adoption of new accounting standards

We consider the applicability and impact of all ASUs. We adopted the following ASUs effective January 1, 2022, none of which had a material impact on our financial statements:

ASU	Description
2020-06	Debt with conversion and other options and derivatives and hedging
2021-05	Lessor - Variable lease payments
2021-10	Government assistance

B. Accounting standards issued but not yet adopted

We consider the applicability and impact of all ASUs. We assessed ASUs and determined that they either were not applicable or were not expected to have a material impact on our financial statements.

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2. Sales and revenue recognition

A. Sales of Machinery, Energy & Transportation

We recognize sales of ME&T when all the following criteria are satisfied: (i) a contract with an independently owned and operated dealer or an end user exists which has commercial substance; (ii) it is probable we will collect the amount charged to the dealer or end user; and (iii) we have completed our performance obligation whereby the dealer or end user has obtained control of the product. A contract with commercial substance exists once we receive and accept a purchase order under a dealer sales agreement, or once we enter into a contract with an end user. If collectibility is not probable, the sale is deferred and not recognized until collection is probable or payment is received. Control of our products typically transfers when title and risk of ownership of the product has transferred to the dealer or end user. Typically, where product is produced and sold in the same country, title and risk of ownership transfer when we ship the product. Products that are exported from a country for sale typically transfer title and risk of ownership at the border of the destination country.

Our remanufacturing operations are primarily focused on the remanufacture of Cat engines and components and rail related products. In this business, we inspect, clean and remanufacture used engines and related components (core). In connection with the sale of our remanufactured product to dealers, we collect a deposit that is repaid if the dealer returns an acceptable core within a specified time period. Caterpillar owns and has title to the cores when they are returned from dealers. The rebuilt engine or component (the core plus any new content) is then sold as a remanufactured product to dealers and end users. We recognize revenue pursuant to the same transfer of control criteria as ME&T sales noted above. At the time of sale, we recognize the deposit in Other current liabilities in Statement 3, and we recognize the core to be returned as an asset in Prepaid expenses and other current assets in Statement 3 at the estimated replacement cost (based on historical experience with usable cores). Upon receipt of an acceptable core, we repay the deposit and relieve the liability. We then transfer the returned core asset into inventory. In the event that the deposit is forfeited (i.e., upon failure by the dealer to return an acceptable core in the specified time period), we recognize the core deposit and the cost of the core in Sales and Cost of goods sold, respectively.

We provide discounts to dealers through merchandising programs. We have numerous programs that are designed to promote the sale of our products. The most common dealer programs provide a discount when the dealer sells a product to a targeted end user. Generally, we estimate the cost of these discounts for each product by model by geographic region based on historical experience and known changes in merchandising programs. We report the cost of these discounts as a reduction to the transaction price when we recognize the product sale. We accrue a corresponding post-sale discount reserve in Statement 3, which represents discounts we expect to pay on units sold. If discounts paid differ from those estimated, we report the difference as a change in the transaction price.

Except for replacement parts, no right of return exists on the sale of our products. We estimate replacement part returns based on historical experience and recognize a parts return asset in Prepaid expenses and other current assets in Statement 3, which represents our right to recover replacement parts we expect will be returned. We also recognize a refund liability in Other current liabilities in Statement 3 for the refund we expect to pay for returned parts. If actual replacement part returns differ from those estimated, we recognize the difference in the estimated replacement part return asset and refund liability in Cost of goods sold and Sales, respectively.

Trade receivables represent amounts due from dealers and end users for the sale of our products, and include amounts due from wholesale inventory financing provided by Cat Financial for a dealer's purchase of inventory. See Note 7 for further information. We recognize trade receivables from dealers and end users in Receivables - trade and other and Long-term receivables trade and other in Statement 3. Trade receivables from dealers and end users were \$7,551 million, \$7,267 million and \$6,310 million as of December 31, 2022, 2021 and 2020, respectively. Long-term trade receivables from dealers and end users were \$506 million, \$624 million and \$657 million as of December 31, 2022, 2021 and 2020, respectively.

Our standard dealer invoice terms are established by marketing region. Our invoice terms for end user sales are established by the responsible business unit. Payments from dealers are due shortly after the time of sale. When we make a sale to a dealer, the dealer is responsible for payment even if the product is not sold to an end user. Dealers and end users must make payment within the established invoice terms to avoid potential interest costs. Interest at or above prevailing market rates may be charged on any past due balance, and generally our practice is to not forgive this interest. Our allowance for credit losses is not significant for ME&T receivables.

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For certain contracts, we invoice for payment when contractual milestones are achieved. We recognize a contract asset when a sale is recognized prior to invoicing. We reduce the contract asset when we invoice for payment and recognize a corresponding trade receivable. Contract assets are included in Prepaid expenses and other current assets in Statement 3. Contract assets were \$247 million, \$187 million and \$187 million as of December 31, 2022, 2021 and 2020, respectively.

We invoice in advance of recognizing the sale of certain products. We recognize advanced customer payments as a contract liability in Customer advances and Other liabilities in Statement 3. Contract liabilities were \$2,314 million, \$1,557 million and \$1,526 million as of December 31, 2022, 2021 and 2020, respectively. We reduce the contract liability when we recognize revenue. During 2022, we recognized \$902 million of revenue that was recorded as a contract liability at the beginning of 2022. During 2021, we recognized \$903 million of revenue that was recorded as a contract liability at the beginning of 2021.

We have elected the practical expedient to not adjust the amount of revenue to be recognized under a contract with a dealer or end user for the effects of time value of money when the timing difference between receipt of payment and recognition of revenue is less than one year.

As of December 31, 2022, we have entered into contracts with dealers and end users for which sales have not been recognized as we have not satisfied our performance obligations and transferred control of the products. The dollar amount of unsatisfied performance obligations for contracts with an original duration greater than one year is \$12.2 billion, with about one-half of the amount expected to be completed and revenue recognized in the twelve months following December 31, 2022. We have elected the practical expedient to not disclose unsatisfied performance obligations with an original contract duration of one year or less. Contracts with an original duration of one year or less are primarily sales to dealers for machinery, engines and replacement parts.

We exclude sales and other related taxes from the transaction price. We account for shipping and handling costs associated with outbound freight after control over a product has transferred as a fulfillment cost which is included in Cost of goods sold.

We provide a standard manufacturer's warranty of our products at no additional cost. At the time we recognize a sale, we record estimated future warranty costs. See Note 21 for further discussion of our product warranty liabilities.

See Note 23 for further disaggregated sales and revenues information.

B. Revenues of Financial Products

Revenues of Financial Products are generated primarily from finance revenue on finance receivables and rental payments on operating leases. We record finance revenue over the life of the related finance receivables using the interest method, including the accretion of certain direct origination costs that are deferred. We recognize revenue from rental payments received on operating leases on a straight-line basis over the term of the lease.

We suspend recognition of finance revenue and operating lease revenue and place the account on non-accrual status when management determines that collection of future income is not probable (generally after 120 days past due). We resume recognition of revenue, and recognize previously suspended income, when we consider collection of remaining amounts to be probable. We write off interest earned but uncollected prior to the receivables being placed on non-accrual status through Provision for credit losses when, in the judgment of management, we consider it to be uncollectible. See Note 7 for more information.

3. Stock-based compensation

Our stock-based compensation plans primarily provide for the granting of stock options, restricted stock units (RSUs) and performance-based restricted stock units (PRSUs) to Officers and other key employees, as well as non-employee Directors. Stock options permit a holder to buy Caterpillar stock at the stock's price when the option was granted. RSUs are agreements to issue shares of Caterpillar stock at the time of vesting. PRSUs are similar to RSUs and include performance conditions in the vesting terms of the award.

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Our long-standing practices and policies specify that the Compensation Committee (the Committee) of the Board of Directors approve all stock-based compensation awards. The award approval process specifies the grant date, value and terms of the award. We consistently apply the same terms and conditions to all employee grants, including Officers. The Committee approves all individual Officer grants. We determine the number of stock-based compensation award units included in an individual's award based on the methodology approved by the Committee. The exercise price methodology approved by the Committee is the closing price of the Company stock on the date of the grant. In June of 2014, shareholders approved the Caterpillar Inc. 2014 Long-Term Incentive Plan (the Plan) under which all new stock-based compensation awards are granted. In June of 2017, shareholders amended and restated the Plan. The Plan initially provided that up to 38,800,000 Common Shares would be reserved for future issuance under the Plan, subject to adjustment in certain events. Subsequent to the shareholder approval of the amendment and restatement of the Plan, an additional 36,000,000 Common Shares became available for all awards under the Plan.

Common stock issued from Treasury stock under the plans totaled 2,340,887 for 2022, 3,571,503 for 2021 and 5,317,243 for 2020. The total number of shares authorized for equity awards under the amended and restated Caterpillar Inc. 2014 Long-Term Incentive Plan is 74,800,000, of which 31,334,705 shares remained available for issuance as of December 31, 2022.

Stock option and RSU awards generally vest according to a three-year graded vesting schedule. One-third of the award will become vested on the first anniversary of the grant date, one-third of the award will become vested on the second anniversary of the grant date and one-third of the award will become vested on the third anniversary of the grant date. PRSU awards generally have a three-year performance period and cliff vest at the end of the period based upon achievement of performance targets established at the time of grant.

Upon separation from service, if the participant is 55 years of age or older with more than five years of service, the participant meets the criteria for a "Long Service Separation." Award terms for stock option and RSU grants allow for continued vesting as of each vesting date specified in the award document for employees who meet the criteria for a "Long Service Separation" and fulfill a requisite service period of six months. We recognize compensation expense for eligible employees for the grants over the period from the grant date to the end date of the six-month requisite service period. For employees who become eligible for a "Long Service Separation" subsequent to the end date of the six-month requisite service period and prior to the completion of the vesting period, we recognized compensation expense over the period from the grant date to the date eligibility is achieved.

Award terms for PRSU grants allow for continued vesting upon achievement of the performance target specified in the award document for employees who meet the criteria for a "Long Service Separation" and fulfill a requisite service period of six months. We recognize compensation expense for the PRSU grants with respect to employees who have met the criteria for a "Long Service Separation" over the period from the grant date to the end of the six-month requisite service period. For employees who become eligible for a "Long Service Separation" subsequent to the end date of the six-month requisite service period and prior to the completion of the vesting period, we recognize compensation expense over the period from the grant date to the date eligibility is achieved.

At grant, option awards have a term life of ten years. For awards granted prior to 2016, if the "Long Service Separation" criteria are met, the vested options have a life that is the lesser of ten years from the original grant date or five years from the separation date. For awards granted beginning in 2016, the vested options have a life equal to ten years from the original grant date.

Accounting guidance on share-based payments requires companies to estimate the fair value of options on the date of grant using an option-pricing model. The fair value of our option grants was estimated using the Black-Scholes option-pricing model. The Black-Scholes option-pricing model considers a range of assumptions related to volatility, risk-free interest rate and historical employee behavior. Expected volatility was based on historical Caterpillar stock price movement and current implied volatilities from traded options on Caterpillar stock. The risk-free interest rate was based on U.S. Treasury security yields at the time of grant. The weighted-average dividend yield was based on historical information. We determine the expected life from the actual historical employee exercise behavior. The following table provides the assumptions used in determining the fair value of the Option awards for the years ended December 31, 2022, 2021 and 2020, respectively.

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	Grant Year		
	2022	2021	2020
Weighted-average dividend yield	2.6 %	2.6 %	2.5 %
Weighted-average volatility	31.7 %	32.9 %	25.7 %
Range of volatilities	25.3%-36.8%	29.2%-45.8%	24.5%- 29.7%
Range of risk-free interest rates	1.03%-2%	0.06%-1.41%	1.21%-1.39%
Weighted-average expected lives	8 years	8 years	8 years

Beginning with the 2018 grant, we credit RSU and PRSU awards with dividend equivalent units on each date that we pay a cash dividend to holders of Common stock. We determine the fair value of the RSU and PRSU awards granted in 2022, 2021 and 2020 as the closing stock price on the date of the grant.

Please refer to Tables I and II below for additional information on our stock-based compensation awards.

TABLE I — Financial Information Related to Stock-based Compensation

	Stock options		RSUs		PRSU	
	Shares	Weighted-Average Exercise Price	Shares	Weighted-Average Grant Date Fair Value	Shares	Weighted-Average Grant Date Fair Value
Outstanding at January 1, 2022	7,722,420	\$ 127.52	1,100,181	\$ 166.50	645,373	\$ 165.74
Granted to officers and key employees	1,029,202	\$ 196.70	507,284	\$ 196.06	277,192	\$ 195.17
Exercised	(1,888,557)	\$ 108.40	—	\$ —	—	\$ —
Vested	—	\$ —	(581,132)	\$ 154.77	(375,773)	\$ 127.60
Forfeited / expired	(61,739)	\$ 182.24	(35,530)	\$ 183.91	(22,052)	\$ 170.75
Outstanding at December 31, 2022	<u>6,801,326</u>	<u>\$ 142.85</u>	<u>990,803</u>	<u>\$ 187.88</u>	<u>524,740</u>	<u>\$ 208.39</u>
Exercisable at December 31, 2022	<u>4,481,546</u>	<u>\$ 120.77</u>				

Stock options outstanding and exercisable as of December 31, 2022:

Exercise Prices	Outstanding				Exercisable			
	Shares Outstanding at 12/31/2022	Weighted-Average Remaining Contractual Life (Years)	Weighted-Average Exercise Price	Aggregate Intrinsic Value ¹	Shares Outstanding at 12/31/2022	Weighted-Average Remaining Contractual Life (Years)	Weighted-Average Exercise Price	Aggregate Intrinsic Value ¹
\$74.77-\$88.51	1,254,848	2.75	\$ 78.54	\$ 202	1,254,848	2.75	\$ 78.54	\$ 202
\$89.75-\$110.09	812,203	3.47	\$ 95.50	117	811,698	3.47	\$ 95.50	117
\$127.60	1,167,848	7.27	\$ 127.72	131	555,435	7.27	\$ 127.60	62
\$138.35-\$151.12	1,517,053	5.78	\$ 144.36	144	1,517,053	5.78	\$ 144.36	144
\$196.70-\$219.76	2,049,374	8.79	\$ 208.49	64	342,512	8.28	\$ 219.76	7
	<u>6,801,326</u>		<u>\$ 142.85</u>	<u>\$ 658</u>	<u>4,481,546</u>		<u>\$ 120.77</u>	<u>\$ 532</u>

¹ The difference between a stock award's exercise price and the underlying stock's closing market price at December 31, 2022, for awards with market price greater than the exercise price. Amounts are in millions of dollars.

The computations of weighted-average exercise prices and aggregate intrinsic values are not applicable to RSUs or PRSUs since these awards represent an agreement to issue shares of stock at the time of vesting. At December 31, 2022, there were 990,803 outstanding RSUs with a weighted average remaining contractual life of 1.4 years and 524,740 outstanding PRSUs with a weighted-average remaining contractual life of 1.5 years.

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(Dollars in millions except per share data)	2022	2021	2020
Stock options activity:			
Weighted-average fair value per share of stock awards granted			
\$ 51.69	\$ 56.30	\$ 25.98	
Intrinsic value of stock awards exercised	\$ 217	\$ 374	\$ 386
Fair value of stock awards vested ¹	\$ 56	\$ 59	\$ 64
Cash received from stock awards exercised	\$ 123	\$ 212	\$ 282
RSUs activity:			
Weighted-average fair value per share of stock awards granted			
\$ 196.06	\$ 216.50	\$ 128.07	
Fair value of stock awards vested ²	\$ 105	\$ 136	\$ 87
PRSUs activity:			
Weighted-average fair value per share of stock awards granted			
\$ 195.17	\$ 215.45	\$ 128.41	
Fair value of stock awards vested ²	\$ 90	\$ 74	\$ 59

¹ Based on the grant date fair value.² Based on the underlying stock's closing market price on the vesting date.

In accordance with guidance on share-based payments, stock-based compensation expense is based on the grant date fair value and is classified within Cost of goods sold, Selling, general and administrative expenses and Research and development expenses corresponding to the same line item as the cash compensation paid to respective employees, officers and non-employee directors. We recognize stock-based compensation expense on a straight-line basis over the requisite service period for awards with terms that specify cliff or graded vesting and contain only service conditions. Stock-based compensation expense for PRSUs is based on the probable number of shares expected to vest and is recognized primarily on a straight-line basis.

Before tax, stock-based compensation expense for 2022, 2021 and 2020 was \$193 million, \$200 million and \$202 million, respectively, with a corresponding income tax benefit of \$32 million, \$23 million and \$34 million, respectively.

The amount of stock-based compensation expense capitalized for the years ended December 31, 2022, 2021 and 2020 did not have a significant impact on our financial statements.

At December 31, 2022, there was \$140 million of total unrecognized compensation cost from stock-based compensation arrangements granted under the plans, which is related to non-vested stock-based awards. We expect to recognize the compensation expense over a weighted-average period of approximately 1.7 years.

We currently use shares in Treasury stock to satisfy share award exercises.

The cash tax benefits realized from stock awards exercised for 2022, 2021 and 2020 were \$63 million, \$102 million and \$108 million, respectively. We use the direct only method and tax law ordering approach to calculate the tax effects of stock-based compensation.

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4. Derivative financial instruments and risk management

Our earnings and cash flow are subject to fluctuations due to changes in foreign currency exchange rates, interest rates and commodity prices. Our Risk Management Policy (policy) allows for the use of derivative financial instruments to prudently manage foreign currency exchange rate, interest rate and commodity price exposures. Our policy specifies that derivatives are not to be used for speculative purposes. Derivatives that we use are primarily foreign currency forward, option and cross currency contracts, interest rate contracts and commodity forward and option contracts. Our derivative activities are subject to the management, direction and control of our senior financial officers. We present at least annually to the Audit Committee of the Board of Directors on our risk management practices, including our use of financial derivative instruments.

We recognize all derivatives at their fair value in Statement 3. On the date the derivative contract is entered into, we designate the derivative as (1) a hedge of the fair value of a recognized asset or liability (fair value hedge), (2) a hedge of a forecasted transaction or the variability of cash flow (cash flow hedge) or (3) an undesignated instrument. We record in current earnings changes in the fair value of a derivative that is qualified, designated and highly effective as a fair value hedge, along with the gain or loss on the hedged recognized asset or liability that is attributable to the hedged risk. We record in AOCI changes in the fair value of a derivative that is qualified, designated and highly effective as a cash flow hedge, to the extent effective, in Statement 3 until we reclassify them to earnings in the same period or periods during which the hedged transaction affects earnings. We report changes in the fair value of undesignated derivative instruments in current earnings. We classify cash flows from designated derivative financial instruments within the same category as the item being hedged on Statement 5. We include cash flows from undesignated derivative financial instruments in the investing category on Statement 5.

We formally document all relationships between hedging instruments and hedged items, as well as the risk-management objective and strategy for undertaking various hedge transactions. This process includes linking all derivatives that are designated as fair value hedges to specific assets and liabilities in Statement 3 and linking cash flow hedges to specific forecasted transactions or variability of cash flow.

We also formally assess, both at the hedge's inception and on an ongoing basis, whether the designated derivatives that are used in hedging transactions are highly effective in offsetting changes in fair values or cash flow of hedged items. When a derivative is determined not to be highly effective as a hedge or the underlying hedged transaction is no longer probable, we discontinue hedge accounting prospectively, in accordance with the derecognition criteria for hedge accounting.

A. Foreign currency exchange rate risk

Foreign currency exchange rate movements create a degree of risk by affecting the U.S. dollar value of sales made and costs incurred in foreign currencies. Movements in foreign currency rates also affect our competitive position as these changes may affect business practices and/or pricing strategies of non-U.S.-based competitors. Additionally, we have balance sheet positions denominated in foreign currencies, thereby creating exposure to movements in exchange rates.

Our ME&T operations purchase, manufacture and sell products in many locations around the world. As we have a diversified revenue and cost base, we manage our future foreign currency cash flow exposure on a net basis. We use foreign currency forward and option contracts to manage unmatched foreign currency cash inflow and outflow. Our objective is to minimize the risk of exchange rate movements that would reduce the U.S. dollar value of our foreign currency cash flow. Our policy allows for managing anticipated foreign currency cash flow for up to approximately five years. As of December 31, 2022, the maximum term of these outstanding contracts at inception was approximately 60 months.

We generally designate as cash flow hedges at inception of the contract any foreign currency forward or option contracts that meet the requirements for hedge accounting and the maturity extends beyond the current quarter-end. We perform designation on a specific exposure basis to support hedge accounting. The remainder of ME&T foreign currency contracts are undesignated.

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In managing foreign currency risk for our Financial Products operations, our objective is to minimize earnings volatility resulting from conversion and the remeasurement of net foreign currency balance sheet positions and future transactions denominated in foreign currencies. Our policy allows the use of foreign currency forward, option and cross currency contracts to offset the risk of currency mismatch between our assets and liabilities and exchange rate risk associated with future transactions denominated in foreign currencies. Our foreign currency forward and option contracts are primarily undesignated. We designate fixed-to-fixed cross currency contracts as cash flow hedges to protect against movements in exchange rates on foreign currency fixed-rate assets and liabilities.

B. Interest rate risk

Interest rate movements create a degree of risk by affecting the amount of our interest payments and the value of our fixed-rate debt. Our practice is to use interest rate contracts to manage our exposure to interest rate changes.

Our ME&T operations generally use fixed-rate debt as a source of funding. Our objective is to minimize the cost of borrowed funds. Our policy allows us to enter into fixed-to-floating interest rate contracts and forward rate agreements to meet that objective. We designate fixed-to-floating interest rate contracts as fair value hedges at inception of the contract, and we designate certain forward rate agreements as cash flow hedges at inception of the contract.

Financial Products operations has a match-funding policy that addresses interest rate risk by aligning the interest rate profile (fixed or floating rate and duration) of Cat Financial's debt portfolio with the interest rate profile of our receivables portfolio within predetermined ranges on an ongoing basis. In connection with that policy, we use interest rate derivative instruments to modify the debt structure to match assets within the receivables portfolio. This matched funding reduces the volatility of margins between interest-bearing assets and interest-bearing liabilities, regardless of which direction interest rates move.

Our policy allows us to use fixed-to-floating, floating-to-fixed and floating-to-floating interest rate contracts to meet the match-funding objective. We designate fixed-to-floating interest rate contracts as fair value hedges to protect debt against changes in fair value due to changes in the benchmark interest rate. We designate most floating-to-fixed interest rate contracts as cash flow hedges to protect against the variability of cash flows due to changes in the benchmark interest rate.

We have, at certain times, liquidated fixed-to-floating and floating-to-fixed interest rate contracts at both ME&T and Financial Products. We amortize the gains or losses associated with these contracts at the time of liquidation into earnings over the original term of the previously designated hedged item.

C. Commodity price risk

Commodity price movements create a degree of risk by affecting the price we must pay for certain raw materials. Our policy is to use commodity forward and option contracts to manage the commodity risk and reduce the cost of purchased materials.

Our ME&T operations purchase base and precious metals embedded in the components we purchase from suppliers. Our suppliers pass on to us price changes in the commodity portion of the component cost. In addition, we are subject to price changes on energy products such as natural gas and diesel fuel purchased for operational use.

Our objective is to minimize volatility in the price of these commodities. Our policy allows us to enter into commodity forward and option contracts to lock in the purchase price of a portion of these commodities within a five-year horizon. All such commodity forward and option contracts are undesignated.

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The location and fair value of derivative instruments reported in Statement 3 were as follows:

(Millions of dollars)	Fair Value			
	December 31, 2022		December 31, 2021	
	Assets ¹	Liabilities ²	Assets ¹	Liabilities ²
Designated derivatives				
Foreign exchange contracts	\$ 462	\$ (152)	\$ 228	\$ (64)
Interest rate contracts	93	(288)	38	(15)
Total	\$ 555	\$ (440)	\$ 266	\$ (79)
Undesignated derivatives				
Foreign exchange contracts	\$ 65	\$ (47)	\$ 46	\$ (42)
Commodity contracts	24	(9)	30	(9)
Total	\$ 89	\$ (56)	\$ 76	\$ (51)

¹ Assets are classified in Statement 3 as Receivables - trade and other or Long-term receivables - trade and other.

² Liabilities are classified in Statement 3 as Accrued expenses or Other liabilities.

The total notional amounts of the derivative instruments as of December 31, 2022 and 2021 were \$24.3 billion and \$18.9 billion, respectively. The notional amounts of the derivative financial instruments do not represent amounts exchanged by the parties. We calculate the amounts exchanged by the parties by referencing the notional amounts and by other terms of the derivatives, such as foreign currency exchange rates, interest rates or commodity prices.

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Gains (Losses) on derivative instruments are categorized as follows:

(Millions of dollars)	Years ended December 31													
	Fair Value / Undesignated Hedges			Cash Flow Hedges										
	Gains (Losses) Recognized in Statement 1 ¹		2022	2021	2020		Gains (Losses) Recognized in AOCI	2022	2021	2020		Gains (Losses) Reclassified from AOCI ²	2022	2021
Foreign exchange contracts	\$ (57)	\$ 104	\$ (74)	\$ 264	\$ 169	\$ (82)	\$ 264	\$ 329	\$ 227	\$ (185)	\$ 329	\$ 329	\$ 227	\$ (185)
Interest rate contracts	(6)	24	15	111	26	(34)	111	11	(31)	(56)	11	11	(31)	(56)
Commodity contracts	51	56	11	—	—	—	—	—	—	—	—	—	—	—
Total	\$ (12)	\$ 184	\$ (48)	\$ 375	\$ 195	\$ (116)	\$ 375	\$ 340	\$ 196	\$ (241)	\$ 340	\$ 340	\$ 196	\$ (241)

¹ Foreign exchange contract and Commodity contract gains (losses) are included in Other income (expense). Interest rate contract gains (losses) are primarily included in Interest expense of Financial Products.

² Foreign exchange contract gains (losses) are primarily included in Other income (expense) in Statement 1. Interest rate contract gains (losses) are primarily included in Interest expense of Financial Products in Statement 1.

The following amounts were recorded in Statement 3 related to cumulative basis adjustments for fair value hedges:

(Millions of dollars)	Years ended December 31					
	Carrying Value of the Hedged Liabilities			Cumulative Amount of Fair Value Hedging Adjustment Included in the Carrying Value of the Hedged Liabilities		
	2022	2021	2022	2021	2022	2021
Long-term debt due within one year	\$ —	\$ 755	\$ —	\$ 5	\$ —	\$ 5
Long-term debt due after one year	4,173	1,304	(280)	(2)	(280)	(2)
Total	\$ 4,173	\$ 2,059	\$ (280)	\$ 3	\$ (280)	\$ 3

We enter into International Swaps and Derivatives Association (ISDA) master netting agreements within ME&T and Financial Products that permit the net settlement of amounts owed under their respective derivative contracts. Under these master netting agreements, net settlement generally permits the company or the counterparty to determine the net amount payable for contracts due on the same date and in the same currency for similar types of derivative transactions. The master netting agreements may also provide for net settlement of all outstanding contracts with a counterparty in the case of an event of default or a termination event.

Collateral is typically not required of the counterparties or of our company under the master netting agreements. As of December 31, 2022 and 2021, no cash collateral was received or pledged under the master netting agreements.

The effect of the net settlement provisions of the master netting agreements on our derivative balances upon an event of default or termination event was as follows:

(Millions of dollars)	December 31, 2022		December 31, 2021	
	Assets	Liabilities	Assets	Liabilities
Gross Amounts Recognized	\$ 644	\$ (496)	\$ 342	\$ (130)
Financial Instruments Not Offset	(233)	233	(114)	114
Cash Collateral Received	—	—	—	—
Net Amount	\$ 411	\$ (263)	\$ 228	\$ (16)

[Table of Contents](#)**5. Other income (expense)**

(Millions of dollars)	Years ended December 31,		
	2022	2021	2020
Investment and interest income	\$ 167	\$ 80	\$ 112
Foreign exchange gains (losses) ¹	104	110	(193)
License fee income	142	123	104
Gains (losses) on securities	(56)	134	37
Net periodic pension and OPEB income (cost), excluding service cost	868	1,279	(90)
Miscellaneous income (loss)	66	88	(14)
Total	\$ 1,291	\$ 1,814	\$ (44)

¹ Includes gains (losses) from foreign exchange derivative contracts. See Note 4 for further details.

6. Income taxes**Reconciliation of the U.S. federal statutory rate to effective rate:**

(Millions of dollars)	Years ended December 31,			
	2022	2021	2020	
Taxes at U.S. statutory rate	\$ 1,838	21.0 %	\$ 839	21.0 %
(Decreases) increases resulting from:				
Non-U.S. subsidiaries taxed at other than the U.S. rate	237	2.7 %	211	2.6 %
State and local taxes, net of federal ¹	89	1.0 %	28	0.3 %
Interest and penalties, net of tax ¹	44	0.5 %	45	0.6 %
U.S. tax incentives	(166)	(1.9)%	(123)	(1.5)%
Net excess tax benefits from stock-based compensation	(33)	(0.4)%	(63)	(0.8)%
Prior year tax and interest adjustments	(90)	(1.0)%	(36)	(0.4)%
Nondeductible goodwill	159	1.8 %	—	— %
Other—net	(11)	(0.1)%	(43)	(0.6)%
Provision (benefit) for income taxes	\$ 2,067	23.6 %	\$ 1,006	25.2 %

¹ Excludes amounts included in other line items.

The negative impact on the effective rate from the portion of the goodwill impairment not deductible for tax purposes is reported in the effective tax rate reconciliation line item above labeled "Nondeductible goodwill." Included in the line item above labeled "Non-U.S. subsidiaries taxed at other than the U.S. rate" are the effects of local and U.S. taxes related to earnings of non-U.S. subsidiaries, changes in the amount of unrecognized tax benefits associated with these earnings, losses at non-U.S. subsidiaries without local tax benefits due to valuation allowances and other permanent differences between tax and U.S. GAAP results.

Distributions of profits from non-U.S. subsidiaries are not expected to cause a significant incremental U.S. tax impact in the future. However, these distributions may be subject to non-U.S. withholding taxes if profits are distributed from certain jurisdictions. Undistributed profits of non-U.S. subsidiaries of approximately \$16 billion are considered indefinitely reinvested. Determination of the amount of unrecognized deferred tax liability related to indefinitely reinvested profits is not feasible primarily due to our legal entity structure and the complexity of U.S. and local tax laws.

[Table of Contents](#)**The components of profit (loss) before taxes were:**

(Millions of dollars)	Years ended December 31,		
	2022	2021	2020
U.S.	\$ 2,962	\$ 2,740	\$ 590
Non-U.S.	5,790	5,464	3,405
	\$ 8,752	\$ 8,204	\$ 3,995

Profit before taxes, as shown above, is based on the location of the entity to which such earnings are attributable. Where an entity's earnings are subject to taxation, however, may not correlate solely to where an entity is located. Thus, the income tax provision shown below as U.S. or non-U.S. may not correspond to the earnings shown above.

The components of the provision (benefit) for income taxes were:

(Millions of dollars)	Years ended December 31,		
	2022	2021	2020
Current tax provision (benefit):			
U.S. ¹	\$ 1,055	\$ 766	\$ 18
Non-U.S.	1,255	1,283	1,031
State (U.S.)	134	76	31
	2,444	2,125	1,080
Deferred tax provision (benefit):			
U.S. ¹	(404)	(387)	(44)
Non-U.S.	50	54	(34)
State (U.S.)	(23)	(50)	4
	(377)	(383)	(74)
Total provision (benefit) for income taxes	\$ 2,067	\$ 1,742	\$ 1,006

¹ Includes U.S. taxes related to non-U.S. earnings. We account for U.S. taxes on global intangible low-taxed income as a period cost.

We paid net income tax and related interest of \$3,076 million, \$1,759 million and \$1,311 million in 2022, 2021 and 2020, respectively.

Accounting for income taxes under U.S. GAAP requires that individual tax-paying entities of the company offset all deferred tax liabilities and assets within each particular tax jurisdiction and present them as a noncurrent deferred tax liability or asset in the Consolidated Financial Position. Amounts in different tax jurisdictions cannot be offset against each other. The amount of deferred income taxes at December 31, included on the following lines in Statement 3, were as follows:

(Millions of dollars)	December 31,	
	2022	2021
Assets:		
Noncurrent deferred and refundable income taxes	\$ 2,047	\$ 1,669
Liabilities:		
Other liabilities	471	412
Deferred income taxes—net	\$ 1,576	\$ 1,257

[Table of Contents](#)**The components of deferred tax assets and liabilities were:**

(Millions of dollars)	December 31,	
	2022	2021
Deferred income tax assets:		
Tax carryforwards	\$ 1,349	\$ 1,380
Research expenditures	949	415
Postemployment benefits	728	959
Employee compensation and benefits	459	464
Warranty reserves	282	266
Post sale discounts	159	143
Inventory valuation	147	40
Lease obligations	144	159
Intercompany prepayments	121	280
Allowance for credit losses	113	106
Other—net	255	268
	4,706	4,480
Deferred income tax liabilities:		
Capital and intangible assets, including lease basis differences	(1,401)	(1,530)
Other outside basis differences	(264)	(264)
Translation	(219)	(188)
Undistributed profits of non-U.S. subsidiaries	(125)	(101)
Bond discount	(107)	(112)
	(2,116)	(2,195)
Valuation allowance for deferred tax assets	(1,014)	(1,028)
Deferred income taxes—net	\$ 1,576	\$ 1,257

At December 31, 2022, approximately \$690 million of U.S. state tax net operating losses and \$110 million of U.S. state tax credit carryforwards were available. These carryforwards primarily expire over the next fifteen years, with some having an unlimited carryforward period.

At December 31, 2022, approximately \$730 million of capital losses and \$60 million of U.S. foreign tax credits were available to carryforward on the U.S. federal tax return. These losses will expire in 2027, while the credits have a ten-year carryforward period and begin to expire in 2029.

At December 31, 2022, net operating loss and interest carryforwards in various non-U.S. taxing jurisdictions were approximately \$4,517 million. Of these, \$996 million expire between 2023 and 2043. The remaining carryforwards do not expire.

At December 31, 2022, non-U.S. entities that have not yet demonstrated consistent and/or sustainable profitability to support the realization of net deferred tax assets have recorded valuation allowances of \$745 million, including certain entities in Luxembourg.

A reconciliation of the beginning and ending amount of gross unrecognized tax benefits for uncertain tax positions, including positions impacting only the timing of tax benefits, follows.

[Table of Contents](#)**Reconciliation of unrecognized tax benefits:¹**

(Millions of dollars)	Years ended December 31,		
	2022	2021	2020
Beginning balance	\$ 1,886	\$ 1,759	\$ 1,778
Additions for tax positions related to current year	72	141	44
Additions for tax positions related to prior years	91	43	46
Reductions for tax positions related to prior years	(66)	(30)	(12)
Reductions for settlements ²	(840)	(24)	(94)
Reductions for expiration of statute of limitations	(3)	(3)	(3)
Ending balance	\$ 1,140	\$ 1,886	\$ 1,759
Amount that, if recognized, would impact the effective tax rate	\$ 874	\$ 1,688	\$ 1,657

¹ Foreign currency impacts are included within each line as applicable.

² Includes cash payment or other reduction of assets to settle liability.

We classify interest and penalties on income taxes as a component of the provision for income taxes. We recognized a net provision for interest and penalties of \$49 million, \$54 million and \$38 million during the years ended December 31, 2022, 2021 and 2020, respectively. The total amount of interest and penalties accrued was \$95 million and \$297 million as of December 31, 2022 and 2021, respectively.

On September 8, 2022, the company reached a settlement with the U.S. Internal Revenue Service (IRS) that resolves all issues for tax years 2007 through 2016, without any penalties. The company's settlement includes, among other issues, the resolution of disputed tax treatment of profits earned by Caterpillar SARL (CSARL) from certain parts transactions. We vigorously contested the IRS's application of the "substance-over-form" or "assignment-of-income" judicial doctrines and its proposed increases to tax and imposition of accuracy related penalties. The settlement does not include any increases to tax in the United States based on those judicial doctrines and does not include any penalties. The final tax assessed by the IRS for all issues under the settlement was \$490 million for the ten-year period. This amount was primarily paid in 2022 along with associated interest of \$250 million. The settlement was within the total amount of gross unrecognized tax benefits for uncertain tax positions and enables us to avoid the costs and burdens of further disputes with the IRS. As a result of the settlement, we recorded a tax benefit of \$41 million in 2022 to reflect changes in estimates of prior years' taxes and related interest, net of tax.

We are subject to the continuous examination of our U.S. federal income tax returns by the IRS, and tax years 2017 to 2019 are currently under examination. In our major non-U.S. jurisdictions including Australia, Brazil, China, Germany, India, Japan, Mexico, Switzerland, Singapore and the U.K., tax years are typically subject to examination for three to ten years. Due to the uncertainty related to the timing and potential outcome of audits, we cannot estimate the range of reasonably possible change in unrecognized tax benefits in the next 12 months.

7. Cat Financial Financing Activities

A. Wholesale inventory receivables

Wholesale inventory receivables are receivables of Cat Financial that arise when Cat Financial provides financing for a dealer's purchase of inventory and were \$1,102 million and \$1,098 million, at December 31, 2022 and 2021, respectively. We include these receivables in Receivables—trade and other and Long-term receivables—trade and other in Statement 3.

[Table of Contents](#)**Contractual maturities of outstanding wholesale inventory receivables:**

(Millions of dollars)

Amounts Due In	December 31, 2022		
	Wholesale Loans	Wholesale Leases	Total
2023	\$ 547	\$ 44	\$ 591
2024	166	35	201
2025	118	27	145
2026	54	12	66
2027	14	4	18
Thereafter	2	—	2
Total	901	122	1,023
Guaranteed residual value ¹	57	22	79
Unguaranteed residual value ¹	2	25	27
Less: Unearned income	(12)	(15)	(27)
Total	<u><u>\$ 948</u></u>	<u><u>\$ 154</u></u>	<u><u>\$ 1,102</u></u>

¹ For Wholesale loans, represents residual value on failed sale leasebacks.

Cat Financial's wholesale inventory receivables generally may be repaid or refinanced without penalty prior to contractual maturity.

Please refer to Note 18 for fair value information.

B. Finance receivables

Finance receivables are receivables of Cat Financial and are reported in Statement 3 net of an allowance for credit losses.

Contractual maturities of outstanding finance receivables:

(Millions of dollars)

Amounts Due In	December 31, 2022		
	Retail Loans	Retail Leases	Total
2023	\$ 6,317	\$ 2,814	\$ 9,131
2024	3,772	1,775	5,547
2025	2,671	994	3,665
2026	1,482	532	2,014
2027	533	171	704
Thereafter	116	39	155
Total	14,891	6,325	21,216
Guaranteed residual value ¹	12	378	390
Unguaranteed residual value ¹	2	638	640
Less: Unearned income	(335)	(554)	(889)
Total	<u><u>\$ 14,570</u></u>	<u><u>\$ 6,787</u></u>	<u><u>\$ 21,357</u></u>

¹ For Retail loans, represents residual value on failed sale leasebacks.

Cat Financial's finance receivables generally may be repaid or refinanced without penalty prior to contractual maturity.

Please refer to Note 18 for fair value information.

C. Allowance for credit losses

Portfolio segments

A portfolio segment is the level at which Cat Financial develops a systematic methodology for determining its allowance for credit losses. Cat Financial's portfolio segments and related methods for estimating expected credit losses are as follows:

Customer

Cat Financial provides loans and finance leases to end-user customers primarily for the purpose of financing new and used Caterpillar machinery, engines and equipment for commercial use. Cat Financial also provides financing for vehicles, power generation facilities and marine vessels that, in most cases, incorporate Caterpillar products. The average original term of Cat Financial's customer finance receivable portfolio was approximately 50 months with an average remaining term of approximately 27 months as of December 31, 2022.

Cat Financial typically maintains a security interest in financed equipment and requires physical damage insurance coverage on the financed equipment, both of which provide Cat Financial with certain rights and protections. If Cat Financial's collection efforts fail to bring a defaulted account current, Cat Financial generally can repossess the financed equipment, after satisfying local legal requirements, and sell it within the Caterpillar dealer network or through third-party auctions.

Cat Financial estimates the allowance for credit losses related to its customer finance receivables based on loss forecast models utilizing probabilities of default and the estimated loss given default based on past loss experience adjusted for current conditions and reasonable and supportable forecasts capturing country and industry-specific economic factors.

During the year ended December 31, 2022, Cat Financial's forecasts for the markets in which it operates reflected a continuation of the trend of relatively low unemployment rates and delinquencies. However, high inflation rates and consequent central bank actions are weakening global economic growth. The company believes the economic forecasts employed represent reasonable and supportable forecasts, followed by a reversion to long-term trends.

Dealer

Cat Financial provides financing to Caterpillar dealers in the form of wholesale financing plans. Cat Financial's wholesale financing plans provide assistance to dealers by financing their mostly new Caterpillar equipment inventory and rental fleets on a secured and unsecured basis. In addition, Cat Financial provides a variety of secured and unsecured loans to Caterpillar dealers.

Cat Financial estimates the allowance for credit losses for dealer finance receivables based on historical loss rates with consideration of current economic conditions and reasonable and supportable forecasts.

In general, Cat Financial's Dealer portfolio segment has not historically experienced large increases or decreases in credit losses based on changes in economic conditions due to its close working relationships with the dealers and their financial strength. Therefore, Cat Financial made no adjustments to historical loss rates during the year ended December 31, 2022.

Classes of finance receivables

Cat Financial further evaluates portfolio segments by the class of finance receivables, which is defined as a level of information (below a portfolio segment) in which the finance receivables have the same initial measurement attribute and a similar method for assessing and monitoring credit risk. Cat Financial's classes, which align with management reporting for credit losses, are as follows:

- **North America** - Finance receivables originated in the United States and Canada.
- **EAME** - Finance receivables originated in Europe, Africa, the Middle East and the Commonwealth of Independent States.
- **Asia/Pacific** - Finance receivables originated in Australia, New Zealand, China, Japan, Southeast Asia and India.
- **Mining** - Finance receivables related to large mining customers worldwide.
- **Latin America** - Finance receivables originated in Mexico and Central and South American countries.
- **Caterpillar Power Finance** - Finance receivables originated worldwide related to marine vessels with Caterpillar engines and Caterpillar electrical power generation, gas compression and co-generation systems and non-Caterpillar equipment that is powered by these systems.

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Receivable balances, including accrued interest, are written off against the allowance for credit losses when, in the judgment of management, they are considered uncollectible (generally upon repossession of the collateral). Generally, the amount of the write-off is determined by comparing the fair value of the collateral, less cost to sell, to the amortized cost. Subsequent recoveries, if any, are credited to the allowance for credit losses when received.

An analysis of the allowance for credit losses was as follows:

(Millions of dollars)	December 31, 2022			December 31, 2021		
	Customer	Dealer	Total	Customer	Dealer	Total
Allowance for Credit Losses:						
Beginning balance	\$ 251	\$ 82	\$ 333	\$ 431	\$ 44	\$ 475
Write-offs	(108)	—	(108)	(256)	—	(256)
Recoveries	62	—	62	51	—	51
Provision for credit losses	75	(17)	58	30	38	68
Other	(3)	—	(3)	(5)	—	(5)
Ending balance	\$ 277	\$ 65	\$ 342	\$ 251	\$ 82	\$ 333
Finance Receivables	\$ 19,772	\$ 1,585	\$ 21,357	\$ 20,135	\$ 1,793	\$ 21,928

Credit quality of finance receivables

At origination, Cat Financial evaluates credit risk based on a variety of credit quality factors including prior payment experience, customer financial information, credit ratings, loan-to-value ratios, probabilities of default, industry trends, macroeconomic factors and other internal metrics. On an ongoing basis, Cat Financial monitors credit quality based on past-due status as there is a meaningful correlation between the past-due status of customers and the risk of loss. In determining past-due status, Cat Financial considers the entire finance receivable past due when any installment is over 30 days past due.

Customer

The tables below summarize the aging category of Cat Financial's amortized cost of finance receivables in the Customer portfolio segment by origination year:

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(Millions of dollars)	December 31, 2022							Revolving Finance Receivables	Total Finance Receivables
	2022	2021	2020	2019	2018	Prior			
North America									
Current	\$ 3,915	\$ 3,276	\$ 1,525	\$ 653	\$ 206	\$ 34	\$ 240	\$ 9,849	
31-60 days past due	25	26	18	12	4	1	4		90
61-90 days past due	9	15	7	3	1	—	3		38
91+ days past due	11	16	12	6	4	3	4		56
EAME									
Current	1,270	953	477	280	155	68	—		3,203
31-60 days past due	10	12	7	1	1	—	—		31
61-90 days past due	8	4	3	1	—	—	—		16
91+ days past due	6	25	16	4	1	1	—		53
Asia/Pacific									
Current	1,033	684	313	69	18	2	—		2,119
31-60 days past due	10	12	8	1	1	—	—		32
61-90 days past due	2	5	4	2	—	—	—		13
91+ days past due	2	6	6	4	—	—	—		18
Mining									
Current	863	575	220	171	93	108	80		2,110
31-60 days past due	—	1	—	—	—	—	—		1
61-90 days past due	—	—	—	—	—	—	—		—
91+ days past due	—	—	—	—	—	1	—		1
Latin America									
Current	770	400	150	69	26	20	—		1,435
31-60 days past due	7	8	4	2	—	1	—		22
61-90 days past due	2	5	1	1	—	—	—		9
91+ days past due	2	13	11	2	1	—	—		29
Caterpillar Power Finance									
Current	78	85	142	33	18	161	125		642
31-60 days past due	—	—	—	—	—	—	—		—
61-90 days past due	—	—	—	—	—	—	—		—
91+ days past due	—	—	—	—	—	5	—		5
Totals by Aging Category									
Current	7,929	5,973	2,827	1,275	516	393	445		19,358
31-60 days past due	52	59	37	16	6	2	4		176
61-90 days past due	21	29	15	7	1	—	3		76
91+ days past due	21	60	45	16	6	10	4		162
Total Customer	\$ 8,023	\$ 6,121	\$ 2,924	\$ 1,314	\$ 529	\$ 405	\$ 456	\$ 19,772	

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(Millions of dollars)	December 31, 2021							Revolving Finance Receivables	Total Finance Receivables
	2021	2020	2019	2018	2017	Prior			
North America									
Current	\$ 4,792	\$ 2,596	\$ 1,426	\$ 630	\$ 182	\$ 32	\$ 182	\$ 9,840	
31-60 days past due	27	32	20	12	4	1	5		101
61-90 days past due	7	8	5	3	1	1	5		30
91+ days past due	9	17	12	13	5	4	5		65
EAME									
Current	1,499	836	577	352	140	26	—		3,430
31-60 days past due	5	4	3	1	1	—	—		14
61-90 days past due	3	3	3	1	—	—	—		10
91+ days past due	3	11	2	2	—	2	—		20
Asia/Pacific									
Current	1,271	803	307	71	16	2	—		2,470
31-60 days past due	10	14	10	2	—	—	—		36
61-90 days past due	3	7	4	1	—	—	—		15
91+ days past due	2	10	10	3	—	—	—		25
Mining									
Current	851	347	307	193	36	161	36		1,931
31-60 days past due	6	—	—	—	—	—	—		6
61-90 days past due	1	—	—	—	4	—	—		5
91+ days past due	—	1	8	9	3	1	—		22
Latin America									
Current	617	299	160	70	17	18	—		1,181
31-60 days past due	4	7	3	3	1	—	—		18
61-90 days past due	3	3	1	1	—	—	—		8
91+ days past due	4	9	9	7	7	14	—		50
Caterpillar Power Finance									
Current	117	145	97	70	180	104	101		814
31-60 days past due	—	—	—	—	—	—	—		—
61-90 days past due	—	—	—	—	—	—	—		—
91+ days past due	—	—	—	—	—	44	—		44
Totals by Aging Category									
Current	9,147	5,026	2,874	1,386	571	343	319		19,666
31-60 days past due	52	57	36	18	6	1	5		175
61-90 days past due	17	21	13	6	5	1	5		68
91+ days past due	18	48	41	34	15	65	5		226
Total Customer	<u>\$ 9,234</u>	<u>\$ 5,152</u>	<u>\$ 2,964</u>	<u>\$ 1,444</u>	<u>\$ 597</u>	<u>\$ 410</u>	<u>\$ 334</u>	<u>\$ 20,135</u>	

Finance receivables in the Customer portfolio segment are substantially secured by collateral, primarily in the form of Caterpillar and other equipment. For those contracts where the borrower is experiencing financial difficulty, repayment of the outstanding amounts is generally expected to be provided through the operation or repossession and sale of the equipment.

[Table of Contents](#)**Dealer**

As of December 31, 2022 and 2021, Cat Financial's total amortized cost of finance receivables within the Dealer portfolio segment was current, with the exception of \$58 million and \$78 million, respectively, that was 91+ days past due in Latin America, all of which was originated in 2017.

Non-accrual finance receivables

Recognition of income is suspended and the finance receivable is placed on non-accrual status when management determines that collection of future income is not probable. Contracts on non-accrual status are generally more than 120 days past due or have been restructured in a troubled debt restructuring (TDR). Recognition is resumed and previously suspended income is recognized when the collection of remaining amounts is considered probable. Payments received while the finance receivable is on non-accrual status are applied to interest and principal in accordance with the contractual terms. Interest earned but uncollected prior to the receivable being placed on non-accrual status is written off through Provision for credit losses when, in the judgment of management, it is considered uncollectible.

In Cat Financial's Customer portfolio segment, finance receivables which were on non-accrual status and finance receivables over 90 days past due and still accruing income were as follows:

(Millions of dollars)	December 31, 2022			December 31, 2021		
	Amortized Cost			Amortized Cost		
	Non-accrual With an Allowance	Non-accrual Without an Allowance	91+ Still Accruing	Non-accrual With an Allowance	Non-accrual Without an Allowance	91+ Still Accruing
North America	\$ 52	\$ 4	\$ 11	\$ 47	\$ 9	\$ 12
EAME	43	—	10	18	1	2
Asia/Pacific	11	—	7	19	—	7
Mining	—	1	—	8	1	14
Latin America	45	—	—	52	4	1
Caterpillar Power Finance	5	11	—	40	11	—
Total	\$ 156	\$ 16	\$ 28	\$ 184	\$ 26	\$ 36

There was \$17 million, \$12 million and \$12 million of interest income recognized during the years ended December 31, 2022, 2021 and 2020, respectively, for customer finance receivables on non-accrual status.

As of December 31, 2022 and 2021, finance receivables in Cat Financial's Dealer portfolio segment on non-accrual status were \$58 million and \$78 million, respectively, all of which was in Latin America.

Troubled debt restructurings

A restructuring of a finance receivable constitutes a TDR when the lender grants a concession it would not otherwise consider to a borrower experiencing financial difficulties. Concessions granted may include extended contract maturities, inclusion of interest only periods, below market interest rates, payment deferrals and reduction of principal and/or accrued interest. Cat Financial individually evaluates TDR contracts and establishes an allowance based on the present value of expected future cash flows discounted at the receivable's effective interest rate, the fair value of the collateral for collateral-dependent receivables or the observable market price of the receivable.

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There were no finance receivables modified as TDRs during the years ended December 31, 2022, 2021 and 2020 for the Dealer portfolio segment. Cat Financial's finance receivables in the Customer portfolio segment modified as TDRs for the years ended December 31, were as follows:

(Millions of dollars)	Year ended December 31, 2022		Year ended December 31, 2021		Year ended December 31, 2020	
	Pre-TDR Amortized Cost	Post-TDR Amortized Cost	Pre-TDR Amortized Cost	Post-TDR Amortized Cost	Pre-TDR Amortized Cost	Post-TDR Amortized Cost
	Customer					
North America	\$ 6	\$ 6	\$ 6	\$ 6	\$ 13	\$ 13
EAME	1	1	3	3	—	—
Asia/Pacific	—	—	4	4	12	12
Mining	16	16	11	5	35	35
Latin America	22	22	12	12	45	45
Caterpillar Power Finance	20	19	26	22	115	115
Total	\$ 65	\$ 64	\$ 62	\$ 52	\$ 220	\$ 220

The Post-TDR amortized costs in the Customer portfolio segment with a payment default (defined as 91+ days past due) which had been modified within twelve months prior to the default date, were as follows:

(Millions of dollars)	Years ended December 31,		
	2022	2021	2020
Customer			
North America	\$ —	\$ 1	\$ 8
EAME	—	—	10
Asia/Pacific	—	6	2
Mining	5	—	10
Latin America	—	15	1
Caterpillar Power Finance	—	7	18
Total	\$ 5	\$ 29	\$ 49

8. Inventories

Inventories (principally using the LIFO method) are comprised of the following:

(Millions of dollars)	December 31,	
	2022	2021
Raw materials	\$ 6,370	\$ 5,528
Work-in-process	1,452	1,318
Finished goods	8,138	6,907
Supplies	310	285
Total inventories	\$ 16,270	\$ 14,038

[Table of Contents](#)**9. Property, plant and equipment**

(Millions of dollars)	Useful Lives (Years)	December 31,	
		2022	2021
Land	—	\$ 622	\$ 648
Buildings and land improvements	20-45	7,016	7,113
Machinery, equipment and other	2-10	12,282	12,868
Software	3-7	1,556	1,697
Equipment leased to others	1-7	5,568	5,733
Construction-in-process	—	1,020	812
Total property, plant and equipment, at cost		28,064	28,871
Less: Accumulated depreciation		(16,036)	(16,781)
Property, plant and equipment—net		\$ 12,028	\$ 12,090

10. Intangible assets and goodwill**A. Intangible assets**

Intangible assets were comprised of the following:

(Millions of dollars)	Weighted Amortizable Life (Years)	December 31, 2022		
		Gross Carrying Amount	Accumulated Amortization	Net
Customer relationships	16	\$ 2,233	\$ (1,675)	\$ 558
Intellectual property	12	1,473	(1,320)	153
Other	16	132	(85)	47
Total finite-lived intangible assets	14	\$ 3,838	\$ (3,080)	\$ 758

	Weighted Amortizable Life (Years)	December 31, 2021		
		Gross Carrying Amount	Accumulated Amortization	Net
Customer relationships	15	\$ 2,421	\$ (1,709)	\$ 712
Intellectual property	12	1,472	(1,192)	280
Other	14	156	(106)	50
Total finite-lived intangible assets	14	\$ 4,049	\$ (3,007)	\$ 1,042

Finite-lived intangible assets are amortized over their estimated useful lives and tested for impairment if events or changes in circumstances indicate that the asset may be impaired.

Amortization expense related to intangible assets was \$284 million, \$302 million and \$311 million for 2022, 2021 and 2020, respectively.

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As of December 31, 2022, amortization expense related to intangible assets is expected to be:

(Millions of dollars)					
2023	2024	2025	2026	2027	Thereafter
\$226	\$168	\$159	\$88	\$25	\$92

B. Goodwill

Our annual impairment tests completed in the fourth quarter of 2022 indicated the fair value of each reporting unit was substantially above its respective carrying value, including goodwill, with the exception of our Rail reporting unit.

The Rail reporting unit is a part of our Energy & Transportation segment. Rail's product portfolio includes diesel-electric locomotives and other rail-related products and services. The annual impairment test completed in the fourth quarter of 2022 indicated that the fair value of Rail was below its carrying value. Accordingly, we recognized a goodwill impairment charge of \$925 million, resulting in a full impairment of Rail's goodwill balance as of October 1, 2022. There was a \$36 million tax benefit associated with this impairment charge. The valuation of the Rail reporting unit was based on estimates of future cash flows, which assumed a reduced demand forecast, lower margins due to continued inflationary cost pressures, and a discount rate approximately 140 basis points higher than utilized in the prior year valuation. The reduction in the demand forecast in the fourth quarter of 2022 was primarily driven by fourth quarter commercial developments, resulting in a lower outlook for the Company's locomotive offerings.

There were no goodwill impairments during 2021 or 2020.

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The changes in carrying amount of goodwill by reportable segment for the years ended December 31, 2022 and 2021 were as follows:

(Millions of dollars)	December 31, 2021	Acquisitions	Impairment Loss	Other Adjustments ¹	December 31, 2022
Construction Industries					
Goodwill	\$ 302	\$ —	\$ —	\$ (15)	\$ 287
Impairments	(22)	—	—	—	(22)
Net goodwill	<u>280</u>	—	—	(15)	<u>265</u>
Resource Industries					
Goodwill	4,182	—	—	(52)	4,130
Impairments	(1,175)	—	—	—	(1,175)
Net goodwill	<u>3,007</u>	—	—	(52)	<u>2,955</u>
Energy & Transportation					
Goodwill	2,985	25	—	(63)	2,947
Impairment	—	—	(925)	—	(925)
Net goodwill	<u>2,985</u>	<u>25</u>	<u>(925)</u>	<u>(63)</u>	<u>2,022</u>
All Other ²					
Goodwill	52	—	—	(6)	46
Impairment	—	—	—	—	—
Net goodwill	<u>52</u>	—	—	(6)	<u>46</u>
Consolidated total					
Goodwill	7,521	25	—	(136)	7,410
Impairments	(1,197)	—	(925)	—	(2,122)
Net goodwill	<u>\$ 6,324</u>	<u>\$ 25</u>	<u>\$ (925)</u>	<u>\$ (136)</u>	<u>\$ 5,288</u>
	December 31, 2020	Acquisitions	Impairment Loss	Other Adjustments ¹	December 31, 2021
Construction Industries					
Goodwill	\$ 320	\$ 4	\$ —	\$ (22)	\$ 302
Impairments	(22)	—	—	—	(22)
Net goodwill	<u>298</u>	<u>4</u>	—	(22)	<u>280</u>
Resource Industries					
Goodwill	4,253	22	—	(93)	4,182
Impairments	(1,175)	—	—	—	(1,175)
Net goodwill	<u>3,078</u>	<u>22</u>	—	(93)	<u>3,007</u>
Energy & Transportation					
Goodwill	2,959	49	—	(23)	2,985
All Other ²					
Goodwill	59	—	—	(7)	52
Consolidated total					
Goodwill	7,591	75	—	(145)	7,521
Impairments	(1,197)	—	—	—	(1,197)
Net goodwill	<u>\$ 6,394</u>	<u>\$ 75</u>	<u>\$ —</u>	<u>\$ (145)</u>	<u>\$ 6,324</u>

¹ Other adjustments are comprised primarily of foreign currency translation.

² Includes All Other operating segment (See Note 23).

[Table of Contents](#)**11. Investments in debt and equity securities**

We have investments in certain debt and equity securities, which we record at fair value and primarily include in Other assets in Statement 3.

We classify debt securities primarily as available-for-sale. We include the unrealized gains and losses arising from the revaluation of available-for-sale debt securities, net of applicable deferred income taxes, in equity (AOCI in Statement 3). We include the unrealized gains and losses arising from the revaluation of the equity securities in Other income (expense) in Statement 1. We generally determine realized gains and losses on sales of investments using the specific identification method for available-for-sale debt and equity securities and include them in Other income (expense) in Statement 1.

The cost basis and fair value of available-for-sale debt securities with unrealized gains and losses included in equity (AOCI in Statement 3) were as follows:

(Millions of dollars)	December 31, 2022			December 31, 2021		
	Cost Basis	Unrealized Pretax Net Gains (Losses)	Fair Value	Cost Basis	Unrealized Pretax Net Gains (Losses)	Fair Value
	\$ 9	\$ —	\$ 9	\$ 10	\$ —	\$ 10
Government debt securities						
U.S. treasury bonds	\$ 9	\$ —	\$ 9	\$ 10	\$ —	\$ 10
Other U.S. and non-U.S. government bonds	60	(5)	55	61	—	61
Corporate debt securities						
Corporate bonds and other debt securities	2,561	(95)	2,466	1,027	19	1,046
Asset-backed securities	187	(5)	182	175	1	176
Mortgage-backed debt securities						
U.S. governmental agency	364	(31)	333	319	6	325
Residential	3	(1)	2	4	—	4
Commercial	127	(10)	117	98	1	99
Total available-for-sale debt securities	\$ 3,311	\$ (147)	\$ 3,164	\$ 1,694	\$ 27	\$ 1,721

[Table of Contents](#)**Available-for-sale debt securities in an unrealized loss position:**

(Millions of dollars)	December 31, 2022							
	Less than 12 months ¹		12 months or more ¹		Total			
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses		
Government debt securities								
Other U.S. and non-U.S. government bonds	\$ 19	\$ 1	\$ 20	\$ 4	\$ 39	\$ 5		
Corporate debt securities								
Corporate bonds	1,815	46	357	50	2,172	96		
Asset-backed securities	75	2	55	3	130	5		
Mortgage-backed debt securities								
U.S. governmental agency	229	16	98	15	327	31		
Residential	2	—	1	1	3	1		
Commercial	63	5	54	5	117	10		
	\$ 2,203	\$ 70	\$ 585	\$ 78	\$ 2,788	\$ 148		
December 31, 2021								
(Millions of dollars)	Less than 12 months ¹		12 months or more ¹		Total			
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses		
Corporate debt securities								
Corporate bonds	\$ 270	\$ 4	\$ 33	\$ 1	\$ 303	\$ 5		
Mortgage-backed debt securities								
U.S. governmental agency	89	1	22	—	111	1		
Total	\$ 359	\$ 5	\$ 55	\$ 1	\$ 414	\$ 6		

¹ Indicates the length of time that individual securities have been in a continuous unrealized loss position.

The unrealized losses on our investments in government debt securities, corporate debt securities, and mortgage-backed debt securities relate to changes in interest rates and credit-related yield spreads since time of purchase. We do not intend to sell the investments, and it is not likely that we will be required to sell the investments before recovery of their respective amortized cost basis. In addition, we did not expect credit-related losses on these investments as of December 31, 2022.

The cost basis and fair value of available-for-sale debt securities at December 31, 2022, by contractual maturity, are shown below. Expected maturities will differ from contractual maturities because borrowers may have the right to prepay and creditors may have the right to call obligations.

(Millions of dollars)	December 31, 2022	
	Cost Basis	Fair Value
Due in one year or less	\$ 844	\$ 834
Due after one year through five years	1,642	1,568
Due after five years through ten years	260	241
Due after ten years	71	69
U.S. governmental agency mortgage-backed securities	364	333
Residential mortgage-backed securities	3	2
Commercial mortgage-backed securities	127	117
Total debt securities – available-for-sale	\$ 3,311	\$ 3,164

[Table of Contents](#)**Sales of available-for-sale debt securities:**

(Millions of dollars)	Years Ended December 31,		
	2022	2021	2020
Proceeds from the sale of available-for-sale securities	\$ 767	\$ 454	\$ 290
Gross gains from the sale of available-for-sale securities	\$ —	\$ 4	\$ 2
Gross losses from the sale of available-for-sale securities	\$ 5	\$ —	\$ 1

We did not have any investments classified as held-to-maturity debt securities as of December 31, 2022. We had \$964 million of investments in time deposits classified as held-to-maturity debt securities as of December 31, 2021. All these investments mature within one year and we include them in Prepaid expenses and other current assets in Statement 3. We record held-to-maturity debt securities at amortized cost, which approximates fair value.

For the years ended December 31 2022 and 2021, the net unrealized gains (losses) for equity securities held at December 31, 2022 and 2021 were \$(49) million and \$105 million, respectively.

12. Postemployment benefit plans

We provide defined benefit pension plans, defined contribution plans and/or other postretirement benefit plans (retirement health care and life insurance) to employees in many of our locations throughout the world. Our defined benefit pension plans provide a benefit based on years of service and/or the employee's average earnings near retirement. Our defined contribution plans allow employees to contribute a portion of their salary to help save for retirement, and in most cases, we provide a matching contribution. The benefit obligation related to our non-U.S. defined benefit pension plans are for employees located primarily in Europe, Japan and Brazil. For other postretirement benefits (OPEB), substantially all of our benefit obligation is for employees located in the United States.

A. Obligations, assets and funded status

	U.S. Pension Benefits		Non-U.S. Pension Benefits		Other Postretirement Benefits	
	2022	2021	2022	2021	2022	2021
Weighted-average assumptions used to determine benefit obligation, end of year:						
Discount rate	5.4 %	2.8 %	4.3 %	1.8 %	5.4 %	2.7 %
Rate of compensation increase ¹	— %	— %	2.3 %	2.0 %	4.0 %	4.0 %

¹ All U.S. pension benefits are frozen, and accordingly this assumption is no longer applicable.

We use the assumed discount rate to discount future benefit obligations back to today's dollars. The U.S. discount rate is based on a benefit cash flow-matching approach and represents the rate at which our benefit obligations could effectively be settled as of our measurement date, December 31. The benefit cash flow-matching approach involves analyzing Caterpillar's projected cash flows against a high quality bond yield curve, calculated using a wide population of corporate Aa bonds available on the measurement date. We use a similar process to determine the assumed discount rate for our most significant non-U.S. plans. This rate is sensitive to changes in interest rates. A decrease in the discount rate would increase our obligation and expense.

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(Millions of dollars)	U.S. Pension Benefits		Non-U.S. Pension Benefits		Other Postretirement Benefits	
	2022	2021	2022	2021	2022	2021
	\$ 13,069	\$ 17,895	\$ 2,859	\$ 4,311	\$ 2,866	\$ 3,736
Accumulated benefit obligation, end of year						
Benefit obligation, beginning of year	\$ 17,895	\$ 19,177	\$ 4,436	\$ 4,847	\$ 3,736	\$ 4,051
Service cost ¹	—	—	50	57	99	100
Interest cost	401	330	69	53	80	64
Plan amendments	—	—	—	—	(29)	—
Actuarial losses (gains) ²	(4,231)	(610)	(1,084)	(142)	(779)	(211)
Foreign currency exchange rates	—	—	(333)	(154)	—	(15)
Participant contributions	—	—	5	4	43	48
Benefits paid - gross	(995)	(996)	(179)	(184)	(292)	(310)
Less: federal subsidy on benefits paid	—	—	—	—	8	9
Curtailments, settlements and termination benefits	(1)	(6)	(8)	(45)	—	—
Benefit obligation, end of year	\$ 13,069	\$ 17,895	\$ 2,956	\$ 4,436	\$ 2,866	\$ 3,736
Change in plan assets:						
Fair value of plan assets, beginning of year	\$ 17,227	\$ 17,589	\$ 4,552	\$ 4,731	\$ 130	\$ 147
Actual return on plan assets	(3,821)	595	(852)	99	(25)	34
Foreign currency exchange rates	—	—	(328)	(139)	—	—
Company contributions	46	45	54	84	246	211
Participant contributions	—	—	5	4	43	48
Benefits paid	(995)	(996)	(179)	(184)	(292)	(310)
Settlements and termination benefits	(1)	(6)	(8)	(43)	—	—
Fair value of plan assets, end of year	\$ 12,456	\$ 17,227	\$ 3,244	\$ 4,552	\$ 102	\$ 130
Over (under) funded status	\$ (613)	\$ (668)	\$ 288	\$ 116	\$ (2,764)	\$ (3,606)
Components of net amount recognized in financial position:						
Other assets (non-current asset)	\$ 256	\$ 592	\$ 615	\$ 538	\$ —	\$ —
Accrued wages, salaries and employee benefits (current liability)	(48)	(45)	(18)	(16)	(224)	(240)
Liability for postemployment benefits (non-current liability) ³	(821)	(1,215)	(309)	(406)	(2,540)	(3,366)
Net (liability) asset recognized	\$ (613)	\$ (668)	\$ 288	\$ 116	\$ (2,764)	\$ (3,606)
Amounts recognized in Accumulated other comprehensive income (pre-tax) consist of:						
Prior service cost (credit)	\$ —	\$ —	\$ 20	\$ 23	\$ (29)	\$ (5)

¹ All U.S. pension benefits are frozen, and accordingly there is no longer any service cost.

² For 2022, Actuarial loss (gain) impacting the benefit obligation was primarily due to higher discount rates at the end of 2022 compared to the end of 2021. For 2021, Actuarial loss (gain) impacting the benefit obligation was primarily due to higher discount rates at the end of 2021 compared to the end of 2020.

³ The Liability for postemployment benefits reported in Statement 3 includes our liability for other postemployment benefits and our liability for non-qualified deferred compensation plans. For 2022, these liabilities were \$58 million and \$475 million, respectively. For 2021, these liabilities were \$67 million and \$538 million, respectively.

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	U.S. Pension Benefits		Non-U.S. Pension Benefits	
	2022	2021	2022	2021
(Millions of dollars)				
Pension plans with projected benefit obligation in excess of plan assets:				
Projected benefit obligation	\$ 10,413	\$ 14,403	\$ 606	\$ 743
Fair value of plan assets	\$ 9,544	\$ 13,143	\$ 280	\$ 319
Pension plans with accumulated benefit obligation in excess of plan assets:				
Accumulated benefit obligation	\$ 10,413	\$ 14,403	\$ 482	\$ 603
Fair value of plan assets	\$ 9,544	\$ 13,143	\$ 202	\$ 234

The accumulated postretirement benefit obligation exceeds plan assets for all of our other postretirement benefit plans for all years presented.

[Table of Contents](#)**B. Net periodic benefit cost**

(Millions of dollars)	U.S. Pension Benefits			Non-U.S. Pension Benefits			Other Postretirement Benefits		
	2022	2021	2020	2022	2021	2020	2022	2021	2020
Components of net periodic benefit cost:									
Service cost ¹	\$ —	\$ —	\$ —	\$ 50	\$ 57	\$ 55	\$ 99	\$ 100	\$ 94
Interest cost	401	330	483	69	53	68	80	64	103
Expected return on plan assets	(669)	(718)	(791)	(130)	(128)	(135)	(12)	(6)	(12)
Curtailments, settlements and termination benefits	—	—	(1)	1	(1)	30	—	—	—
Amortization of prior service cost (credit)	—	—	—	—	—	—	(6)	(40)	(38)
Actuarial loss (gain) ²	259	(487)	162	(132)	(115)	32	(733)	(231)	189
Net Periodic benefit cost (benefit) ³	\$ (9)	\$ (875)	\$ (147)	\$ (142)	\$ (134)	\$ 50	\$ (572)	\$ (113)	\$ 336

Other changes in plan assets and benefit obligations recognized in other comprehensive income (pre-tax):

Current year prior service cost (credit)	\$ —	\$ —	\$ —	\$ (3)	\$ —	\$ 8	\$ (30)	\$ —	\$ (7)
Amortization of prior service (cost) credit	—	—	—	—	—	—	6	40	38
Total recognized in other comprehensive income	—	—	—	(3)	—	8	(24)	40	31
Total recognized in net periodic cost and other comprehensive income	\$ (9)	\$ (875)	\$ (147)	\$ (145)	\$ (134)	\$ 58	\$ (596)	\$ (73)	\$ 367

Weighted-average assumptions used to determine net periodic benefit cost:

Discount rate used to measure service cost ¹	— %	— %	— %	1.7 %	1.4 %	1.5 %	2.8 %	2.5 %	3.2 %
Discount rate used to measure interest cost	2.3 %	1.8 %	2.8 %	1.7 %	1.2 %	1.7 %	2.2 %	1.6 %	2.8 %
Expected rate of return on plan assets ⁴	4.0 %	4.2 %	5.1 %	3.1 %	2.9 %	3.3 %	6.9 %	6.5 %	7.0 %
Rate of compensation increase ¹	— %	— %	— %	2.0 %	2.0 %	2.0 %	4.0 %	4.0 %	4.0 %

¹ All U.S. pension benefits are frozen, and accordingly there is no longer any service cost and certain assumptions are no longer applicable.

² Actuarial loss (gain) represents the effects of actual results differing from our assumptions and the effects of changing assumptions. We recognize actuarial loss (gain) immediately through earnings upon the annual remeasurement in the fourth quarter, or on an interim basis as triggering events warrant remeasurement.

³ The service cost component is included in Operating costs and all other components are included in Other income (expense) in Statement 1.

⁴ The weighted-average rates for 2023 are 5.8 percent and 5.2 percent for U.S. and non-U.S. pension plans, respectively.

The discount rates used in the determination of our service and interest cost components utilize a full yield curve approach which applies specific spot rates along the yield curve used in the calculation of the benefit obligation to the relevant projected cash flows.

Our expected long-term rate of return on U.S. plan assets is based on our estimate of long-term passive returns for equities and fixed income securities weighted by the allocation of our pension assets. Based on historical performance, we increase the passive returns due to our active management of the plan assets. To arrive at our expected long-term return, the amount added for active management was 0.30 percent for 2022, 0.35 percent for 2021 and 0.40 percent 2020. We use a similar process to determine this rate for our non-U.S. plans.

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The assumed health care trend rate represents the rate at which health care costs are assumed to increase. We assumed a weighted-average increase of 5.6 percent in our calculation of 2022 benefit expense. We expect a weighted-average increase of 6.5 percent during 2023. The 2023 rates are assumed to decrease gradually to the ultimate health care trend rate of 4.7 percent in 2030.

C. Expected contributions and Benefit payments

The following table presents information about expected contributions and benefit payments for pension and other postretirement benefit plans:

(Millions of dollars)	2023							
Expected employer contributions:								
U.S. Pension Benefits	\$ 47							
Non-U.S. Pension Benefits	\$ 69							
Other Postretirement Benefits	\$ 256							
Expected benefit payments:	2023	2024	2025	2026	2027	2028- 2032	Total	
U.S. Pension Benefits	\$ 1,010	\$ 1,000	\$ 1,000	\$ 1,000	\$ 995	\$ 4,820	\$ 9,825	
Non-U.S. Pension Benefits	\$ 195	\$ 170	\$ 175	\$ 185	\$ 190	\$ 1,020	\$ 1,935	
Other Postretirement Benefits	\$ 265	\$ 265	\$ 260	\$ 260	\$ 255	\$ 1,240	\$ 2,545	
Expected Medicare Part D subsidy:	\$ 6	\$ 5	\$ 5	\$ 5	\$ 5	\$ 20	\$ 46	

The above table reflects the total expected employer contributions and expected benefits to be paid from the plan or from company assets and does not include the participants' share of the cost. The expected benefit payments for our other postretirement benefits include payments for prescription drug benefits. The above table also includes Medicare Part D subsidy amounts expected to be received by the company which will offset other postretirement benefit payments.

D. Plan assets

In general, our strategy for both the U.S. and non-U.S. pensions includes ongoing alignment of our investments to our liabilities, while reducing risk in our portfolio. The current U.S. pension target asset allocation is 85 percent fixed income and 15 percent equities. We will revise this target allocation periodically to ensure it reflects our overall objectives. The non-U.S. pension weighted-average target allocations are 79 percent fixed income, 12 percent equities, 5 percent real estate and 4 percent other. The target allocations for each plan vary based upon local statutory requirements, demographics of plan participants and funded status. We primarily invest the non-U.S. plan assets in non-U.S. securities.

Our target allocation for the other postretirement benefit plans is 70 percent equities and 30 percent fixed income.

We rebalance the U.S. plans to within the appropriate target asset allocation ranges on a monthly basis. The frequency of rebalancing for the non-U.S. plans varies depending on the plan. As a result of our diversification strategies, there are no significant concentrations of risk within the portfolio of investments.

We permit the use of certain derivative instruments where appropriate and necessary for achieving overall investment policy objectives. The plans do not use derivative contracts for speculative purposes.

The accounting guidance on fair value measurements specifies a fair value hierarchy based upon the observability of inputs used in valuation techniques (Level 1, 2 and 3). Certain assets that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy. See Note 18 for a discussion of the fair value hierarchy.

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We determine fair values as follows:

- Equity securities are primarily based on valuations for identical instruments in active markets.
- Fixed income securities are primarily based upon models that take into consideration such market-based factors as recent sales, risk-free yield curves and prices of similarly rated bonds.
- Real estate is stated at the fund's net asset value or at appraised value.
- Cash, short-term instruments and other are based on the carrying amount, which approximates fair value, or the fund's net asset value.

The fair value of the pension and other postretirement benefit plan assets by category is summarized below:

(Millions of dollars)	December 31, 2022					Total Assets at Fair Value
	Level 1	Level 2	Level 3	Measured at NAV		
U.S. Pension						
Equity securities:						
U.S. equities	\$ 1,098	\$ 20	\$ 26	\$ 99	\$ 1,243	
Non-U.S. equities	948	—	2	—	—	950
Fixed income securities:						
U.S. corporate bonds	—	5,460	40	37	5,537	
Non-U.S. corporate bonds	—	1,244	—	—	1,244	
U.S. government bonds	—	2,904	—	—	2,904	
U.S. governmental agency mortgage-backed securities	—	19	—	—	—	19
Non-U.S. government bonds	—	118	—	—	—	118
Real estate	—	—	8	—	—	8
Cash, short-term instruments and other	108	14	2	309	433	
Total U.S. pension assets	<u>\$ 2,154</u>	<u>\$ 9,779</u>	<u>\$ 78</u>	<u>\$ 445</u>	<u>\$ 12,456</u>	

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(Millions of dollars)	December 31, 2021					Measured at NAV	Total Assets at Fair Value
	Level 1	Level 2	Level 3				
U.S. Pension							
Equity securities:							
U.S. equities	\$ 1,644	\$ 25	\$ 23	\$ 149	\$ 1,841		
Non-U.S. equities	1,398	—	2	—	1,400		
Fixed income securities:							
U.S. corporate bonds	—	7,289	40	37	7,366		
Non-U.S. corporate bonds	—	1,569	—	—	1,569		
U.S. government bonds	—	4,341	—	—	4,341		
U.S. governmental agency mortgage-backed securities	—	24	—	—	24		
Non-U.S. government bonds	—	172	—	—	172		
Real estate	—	—	7	—	7		
Cash, short-term instruments and other	228	60	—	219	507		
Total U.S. pension assets	<u>\$ 3,270</u>	<u>\$ 13,480</u>	<u>\$ 72</u>	<u>\$ 405</u>	<u>\$ 17,227</u>		

(Millions of dollars)	December 31, 2022					Measured at NAV	Total Assets at Fair Value
	Level 1	Level 2	Level 3				
Non-U.S. Pension							
Equity securities:							
U.S. equities	\$ 61	\$ —	\$ —	\$ —	\$ 61		
Non-U.S. equities	208	28	—	21	257		
Global equities ¹	26	10	—	17	53		
Fixed income securities:							
U.S. corporate bonds	—	186	—	—	186		
Non-U.S. corporate bonds	—	631	—	—	631		
U.S. government bonds	—	66	—	—	66		
Non-U.S. government bonds	—	1,273	—	—	1,273		
Global fixed income ¹	—	82	—	248	330		
Real estate	—	198	—	—	198		
Cash, short-term instruments and other ²	72	117	—	—	189		
Total non-U.S. pension assets	<u>\$ 367</u>	<u>\$ 2,591</u>	<u>\$ —</u>	<u>\$ 286</u>	<u>\$ 3,244</u>		