UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

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

For the Fiscal Year EndedDecember 31, 2021
Commission File Number 1-4949

CUMMINS INC.

Indiana	**35-0257090**
(State of Incorporation)	(IRS Employer Identification No.)

500 Jackson Street
Box 3005
Columbus, Indiana 47202-3005
(Address of principal executive offices)

Telephone (812) 377-5000

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, $2.50 par value	CMI	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: **None.**

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

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

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

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

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

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

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

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. Yes ☒ No ☐

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

The aggregate market value of the voting stock held by non-affiliates was approximately $ 34.7 billion at July 2, 2021. This value includes all shares of the registrant's common stock, except for treasury shares.

As of January 31, 2022, there were 142,426,735 shares outstanding of $2.50 par value common stock.

Documents Incorporated by Reference

Portions of the registrant's definitive Proxy Statement for its 2022 annual meeting of shareholders, which will be filed with the Securities and Exchange Commission on Schedule 14A within 120 days after the end of 2021, will be incorporated by reference in Part III of this Form 10-K to the extent indicated therein upon such filing.

CUMMINS INC. AND SUBSIDIARIES
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Cummins Inc. and its consolidated subsidiaries are hereinafter sometimes referred to as "Cummins," "we," "our," or "us."

CAUTIONARY STATEMENTS REGARDING FORWARD-LOOKING INFORMATION

Certain parts of this annual report contain forward-looking statements intended to qualify for the safe harbors from liability established by the Private Securities Litigation Reform Act of 1995. Forward-looking statements include those that are based on current expectations, estimates and projections about the industries in which we operate and management’s beliefs and assumptions. Forward-looking statements are generally accompanied by words such as "anticipates," "expects," "forecasts," "intends," "plans," "believes," "seeks," "estimates," "could," "should," "may" or words of similar meaning. These statements are not guarantees of future performance and involve certain risks, uncertainties and assumptions, which we refer to as "future factors," which are difficult to predict. Therefore, actual outcomes and results may differ materially from what is expressed or forecasted in such forward-looking statements. Some future factors that could cause our results to differ materially from the results discussed in such forward-looking statements are discussed below and shareholders, potential investors and other readers are urged to consider these future factors carefully in evaluating forward-looking statements. Readers are cautioned not to place undue reliance on forward-looking statements, which speak only as of the date hereof. Future factors that could affect the outcome of forward-looking statements include the following:

GOVERNMENT REGULATION

- any adverse results of our internal review into our emissions certification process and compliance with emission standards;
- increased scrutiny from regulatory agencies, as well as unpredictability in the adoption, implementation and enforcement of emission standards around the world;
- changes in international, national and regional trade laws, regulations and policies;
- any adverse effects of the U.S. government's COVID-19 vaccine mandates;
- changes in taxation;
- global legal and ethical compliance costs and risks;
- increasingly stringent environmental laws and regulations;
- future bans or limitations on the use of diesel-powered products;

BUSINESS CONDITIONS / DISRUPTIONS

- raw material, transportation and labor price fluctuations and supply shortages;
- aligning our capacity and production with our demand;
- the actions of, and income from, joint ventures and other investees that we do not directly control;
- large truck manufacturers' and original equipment manufacturers' customers discontinuing outsourcing their engine supply needs or experiencing financial distress, bankruptcy or change in control;

PRODUCTS AND TECHNOLOGY

- product recalls;
- variability in material and commodity costs;
- the development of new technologies that reduce demand for our current products and services;
- lower than expected acceptance of new or existing products or services;
- product liability claims;
- our sales mix of products;

GENERAL

- failure to complete, adverse results from or failure to realize the expected benefits of the separation of our filtration business;
- our plan to reposition our portfolio of product offerings through exploration of strategic acquisitions and divestitures and related uncertainties of entering such transactions;
- challenging markets for talent and ability to attract, develop and retain key personnel;

- climate change and global warming;
- exposure to potential security breaches or other disruptions to our information technology environment and data security;
- political, economic and other risks from operations in numerous countries including political, economic and social uncertainty and the evolving globalization of our business;
- competitor activity;
- increasing competition, including increased global competition among our customers in emerging markets;
- labor relations or work stoppages;
- foreign currency exchange rate changes;
- the performance of our pension plan assets and volatility of discount rates;
- the price and availability of energy;
- continued availability of financing, financial instruments and financial resources in the amounts, at the times and on the terms required to support our future business; and
- other risk factors described in Item 1A. under the caption "Risk Factors."

Shareholders, potential investors and other readers are urged to consider these factors carefully in evaluating the forward-looking statements and are cautioned not to place undue reliance on such forward-looking statements. The forward-looking statements made herein are made only as of the date of this annual report and we undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise.

PART I

ITEM 1. Business

OVERVIEW

We were founded in 1919 as Cummins Engine Company, a corporation in Columbus, Indiana and one of the first diesel engine manufacturers. In 2001, we changed our name to Cummins Inc. We are a global power leader that designs, manufactures, distributes and services diesel, natural gas, electric and hybrid powertrains and powertrain-related components including filtration, aftertreatment, turbochargers, fuel systems, controls systems, air handling systems, automated transmissions, electric power generation systems, batteries, electrified power systems, hydrogen production and fuel cell products. We sell our products to original equipment manufacturers (OEMs), distributors, dealers and other customers worldwide. We serve our customers through a service network of approximately 500 wholly-owned, joint venture and independent distributor locations and more than 10,000 Cummins certified dealer locations in approximately 190 countries and territories.

COVID-19

The outbreak of COVID-19 in early 2020 became a global pandemic with the resultant economic impacts evolving into a worldwide recession. The pandemic triggered a significant downturn in our markets globally, which negatively impacted our sales and results of operations during 2020. While the majority of the negative impacts to demand largely subsided in 2021, we are still experiencing supply chain disruptions and related financial impacts reflected as increased cost of sales. Our industry continues to be unfavorably impacted by supply chain constraints leading to shortages across multiple components categories and limiting our collective ability to meet end-user demand. Our customers are also experiencing other supply chain issues and slowing production.

OPERATING SEGMENTS

We have five complementary operating segments: Engine, Distribution, Components, Power Systems and New Power. These segments share technology, customers, strategic partners, brand recognition and our distribution network in order to compete more efficiently and effectively in their respective markets. In each of our operating segments, we compete worldwide with a number of other manufacturers and distributors that produce and sell similar products. Our products primarily compete on the basis of performance, price, total cost of ownership, fuel economy, emissions compliance, speed of delivery, quality and customer support.

We use segment earnings or losses before interest expense, income taxes, depreciation and amortization and noncontrolling interests (EBITDA) as the primary basis for the Chief Operating Decision Maker to evaluate the performance of each of our reportable operating segments. We believe EBITDA is a useful measure of our operating performance as it assists investors and debt holders in comparing our performance on a consistent basis without regard to financing methods, capital structure, income taxes or depreciation and amortization methods, which can vary significantly depending upon many factors. See Note 22, "OPERATING SEGMENTS," to the *Consolidated Financial Statements* for additional information and a reconciliation of our segment information to the corresponding amounts in our *Consolidated Statements of Net Income*.

Engine Segment

Engine segment sales and EBITDA as a percentage of consolidated results were:

	Years ended December 31,		
	2021	**2020**	**2019**
Percent of consolidated net sales[1]	**33 %**	32 %	34 %
Percent of consolidated EBITDA[1]	**39 %**	41 %	41 %

[1] Measured before intersegment eliminations

The Engine segment manufactures and markets a broad range of diesel and natural gas-powered engines under the Cummins brand name, as well as certain customer brand names, for the heavy and medium-duty truck, bus, recreational vehicle (RV), light-duty automotive, construction, mining, marine, rail, oil and gas, defense and agricultural markets. We manufacture a wide variety of engine products including:

- Engines with a displacement range of 2.8 to 15 liters and horsepower ranging from 48 to 715 and
- New parts and service, as well as remanufactured parts and engines, primarily through our extensive distribution network.

The Engine segment is organized by engine displacement size and serves these end-user markets:

- **Heavy-duty truck -** We manufacture diesel and natural gas engines that range from 310 to 615 horsepower serving global heavy-duty truck customers worldwide, primarily in North America, China and Australia.
- **Medium-duty truck and bus -**We manufacture diesel and natural gas engines ranging from 130 to 450 horsepower serving medium-duty truck and bus customers worldwide, with key markets including North America, Europe, Latin America, China, Australia and India. Applications include pick-up, delivery, emergency vehicles, regional haul and vocational trucks and school, transit and shuttle buses. We also provide diesel engines for Class A motor homes (RVs), primarily in North America.
- **Light-duty automotive (Pick-up and Light Commercial Vehicle (LCV)) -**We manufacture 105 to 400 horsepower diesel engines, including engines for the pick-up truck market for Stellantis N.V. (Stellantis) in North America and LCV markets in Russia, Latin America and China.
- **Off-highway -** We manufacture diesel engines that range from 48 to 715 horsepower serving key global markets including construction, mining, marine, rail, oil and gas, defense and agriculture and also the power generation business for standby, mobile and distributed power generation solutions throughout the world.

The principal customers of our heavy-duty truck engines include truck manufacturers such as PACCAR Inc. (PACCAR), Navistar International Corporation (Navistar) and Daimler Trucks North America (Daimler). The principal customers of our medium-duty truck engines include truck manufacturers such as Daimler, Navistar and PACCAR. The principal customers of our light-duty on-highway engines are Gorkovsky Avtomobilny Zavod, Anhui Jianghuai Automobile Group Co., Ltd., Volkswagen Caminhões e Ônibus and China National Heavy Duty Truck Group. The principal customer of our pick-up on-highway engines is Stellantis. We sell our industrial engines to manufacturers of construction and agricultural equipment including Hyundai Heavy Industries, Xuzhou Construction Machinery Group, Komatsu, John Deere, JLG Industries, Inc. and Guangxi LiuGong Machinery Co., Ltd.

In the Engine segment, our competitors vary from country to country, with local manufacturers generally predominant in each geography. Other independent engine manufacturers include Weichai Power Co. Ltd., Caterpillar Inc. (CAT) and Deutz AG. Truck OEMs may also elect to produce their own engines, and we must provide competitive products to win and keep their business. Truck OEMs that currently produce some or all of their own engines include Daimler, PACCAR, TRATON AG, Volvo Powertrain, Ford Motor Company, Navistar, China First Auto Works, Dongfeng Motor Corporation, CNH Industrial and Isuzu.

Distribution Segment

Distribution segment sales and EBITDA as a percentage of consolidated results were:

	Years ended December 31,		
	2021	**2020**	**2019**
Percent of consolidated net sales[(1)]	**26 %**	29 %	27 %
Percent of consolidated EBITDA[(1)]	**20 %**	22 %	18 %

[(1)] Measured before intersegment eliminations

The Distribution segment is our primary sales, service and support channel. The segment serves our customers and certified dealers through a worldwide network of wholly-owned, joint venture and independent distribution locations. Wholly-owned locations operate and serve markets in the eight geographic regions noted below. Joint venture locations serve markets in South America, Southeast Asia, India, Middle East and Africa, while independent distribution locations serve markets in these and other geographies.

Distribution's mission encompasses the sales and support of a wide range of products and services, including power generation systems, high-horsepower engines, heavy-duty and medium-duty engines designed for on- and off-highway use, application engineering services, custom-designed assemblies, retail and wholesale aftermarket parts and in-shop and field-based repair services. We also provide selected sales and aftermarket support for the New Power business. Our familiarity with a wide range of market applications allows us to tailor sales, service and support to meet customer-specific needs.

The Distribution segment is organized and managed as eight geographic regions, including North America, Asia Pacific, Europe, Russia, China, Africa and Middle East, India and Latin America. Across these regions, our locations compete with distributors or dealers that offer similar products. In many cases, these competing distributors or dealers are owned by, or affiliated with the companies that are listed as competitors of the Engine, Components or Power Systems segments. These competitors vary by geographical location and application market.

Components Segment

Components segment sales and EBITDA as a percentage of consolidated results were:

	Years ended December 31,		
	2021	**2020**	**2019**
Percent of consolidated net sales[(1)]	**26 %**	24 %	24 %
Percent of consolidated EBITDA[(1)]	**33 %**	32 %	31 %

[(1)] Measured before intersegment eliminations

The Components segment supplies products which complement the Engine and Power Systems segments, including aftertreatment systems, turbochargers, transmissions, filtration products, electronics and fuel systems for commercial diesel and natural gas applications. We develop aftertreatment systems, turbochargers, fuel systems, transmissions and electronics to meet increasingly stringent emission and fuel economy standards. We manufacture filtration systems for on- and off-highway heavy-duty and medium-duty equipment, and we are a supplier of filtration products for industrial vehicle applications.

The Components segment is organized around the following businesses:

- **Emission solutions -** We are a global leader in designing, manufacturing and integrating aftertreatment technology and solutions for the commercial on and off-highway light-duty, medium-duty, heavy-duty and high-horsepower engine markets. Aftertreatment is the mechanism used to convert engine emissions of criteria pollutants, such as particulate matter, nitrogen oxides (NOx), carbon monoxide and unburned hydrocarbons into harmless emissions. Our products include custom engineering systems and integrated controls, oxidation catalysts, particulate filters, selective catalytic reduction systems and engineered components, including dosers. Our emission solutions business primarily serves markets in North America, China, Europe, India, Brazil, Asia Pacific and Russia. We serve both OEM first fit and retrofit customers.
- **Turbo technologies -** We design, manufacture and market turbochargers for light-duty, medium-duty, heavy-duty and high-horsepower diesel markets with worldwide sales and distribution. We provide critical air handling technologies for engines to meet challenging performance requirements and worldwide emission standards. We primarily serve markets in North America, Europe, China, India, Asia Pacific, Brazil and Russia.
- **Filtration -** We design, manufacture and sell filters, coolant and chemical products. Our filtration business offers over 8,800 products for first fit and aftermarket applications including air filters, fuel filters, fuel water separators, lube filters, hydraulic filters, coolants, fuel additives and other filtration systems to OEMs, dealers/distributors and end-users. We support a wide customer base in a diverse range of markets including on and off-highway segments such as oil and gas, agriculture, mining, construction, power generation and marine. We produce and sell globally recognized Fleetguard® branded products globally including in North America, Europe, Asia Pacific, China, South America, Russia, Africa and Middle East. Fleetguard products are available through thousands of distribution points worldwide.
- **Electronics and fuel systems -** We design, develop and supply electronic control modules, sensors and supporting software for on-highway, off-highway and power generation applications. We also design and manufacture new, replacement and remanufactured fuel systems for medium-duty, heavy-duty and high-horsepower diesel engine markets. We primarily serve markets in North America, China, India, Europe and Brazil.
- **Automated transmissions -** We develop and supply automated transmissions for the heavy-duty commercial vehicle market. The Eaton Cummins Automated Transmission Technologies (ECJV) joint venture is a consolidated 50/50 joint venture between Cummins Inc. and Eaton Corporation Plc. and serves markets in North America and China.

Customers of the Components segment generally include the Engine, Distribution and Power Systems segments, joint ventures including Tata Cummins Ltd. and Beijing Foton Cummins Engine Co., Ltd., truck manufacturers and other OEMs, many of which are also customers of the Engine segment, such as PACCAR, Navistar, Daimler, Beiqi Foton Motor Company, Volvo, Stellantis, Komatsu, Scania and other manufacturers that use our components in their product platforms.

The Components segment competes with other manufacturers of aftertreatment systems, filtration, turbochargers, fuel systems and transmissions. Our primary competitors in these markets include Robert Bosch GmbH, Donaldson Company, Inc., Parker-Hannifin Corporation, Mann+Hummel Group, Garrett Motion, Inc., Borg-Warner Inc., Tenneco Inc., Eberspacher Holding GmbH & Co. KG, Denso Corporation, Allison Transmission, Aisin Seiki Co., Ltd. and ZF Friedrichshafen AG.

Power Systems Segment

Power Systems segment sales and EBITDA as a percentage of consolidated results were:

	Years ended December 31,		
	2021	**2020**	**2019**
Percent of consolidated net sales[(1)]	**15 %**	15 %	15 %
Percent of consolidated EBITDA[(1)]	**14 %**	11 %	14 %

[(1)] Measured before intersegment eliminations

The Power Systems segment is organized around the following product lines:

- **Power generation -** We design, manufacture, sell and support standby and prime power generators ranging from 2 kilowatts to 3.5 megawatts, as well as controls, paralleling systems and transfer switches, for applications such as consumer, commercial, industrial, data centers, health care, global rental business, telecommunications and waste water treatment plants. We also provide turnkey solutions for distributed generation and energy management applications using natural gas, diesel or biogas as a fuel.
- **Industrial -** We design, manufacture, sell and support diesel and natural gas high-speed, high-horsepower engines up to 4,400 horsepower for a wide variety of equipment in mining, rail, defense, oil and gas and marine applications throughout the world.
- **Generator technologies -** We design, manufacture, sell and support A/C generator/alternator products for internal consumption and for external generator set assemblers. Our products are sold under the Stamford, Newage and AVK brands and range in output from 7.5 kilovolt-amperes (kVA) to 11,200 kVA.

Our customer base for Power Systems offerings is highly diversified, with customer groups varying based on their power needs. China, Europe, India, Asia Pacific, Latin America, Russia, the Middle East and Africa are our largest geographic markets outside of North America.

In the markets served by the Power Systems segment, we compete with a variety of independent engine manufacturers and generator set assemblers as well as OEMs who manufacture engines for their own products around the world. Our primary competitors are CAT, MTU (Rolls Royce Power Systems Group) and Kohler/SDMO (Kohler Group), but we also compete with INNIO, Generac, Mitsubishi Heavy Industries (MHI) and numerous regional generator set assemblers. Our alternator business competes globally with Leroy Somer (NIDEC), Marathon Electric and Meccalte, among others.

New Power Segment

The New Power segment designs, manufactures, sells and supports hydrogen production solutions as well as electrified power systems ranging from fully electric to hybrid along with innovative components and subsystems, including battery and fuel cell technologies. The New Power segment is currently in the development phase with a primary focus on research and development activities for our power systems, components and subsystems.

We anticipate our customer base for New Power offerings will be highly diversified, representing multiple end markets with a broad range of application requirements. We will continue to pursue relationships in markets as they adopt hydrogen and electric solutions.

In the markets served by the New Power segment, we compete with emerging fuel cell and battery companies, powertrain component manufacturers, vertically integrated OEMs and entities providing hydrogen production solutions. Our primary competitors include Proterra Inc, Romeo Power, Inc., Daimler, PACCAR, Volvo, Navistar, TRATON AG, BYD Company Limited, Dana Incorporated, BorgWarner Inc., Ballard Power Systems, Inc. and Nel ASA.

JOINT VENTURES, ALLIANCES AND NON-WHOLLY-OWNED SUBSIDIARIES

We entered into a number of joint venture agreements and alliances with business partners around the world. Our joint ventures are either distribution or manufacturing entities. We also own controlling interests in non-wholly-owned manufacturing and distribution subsidiaries.

In the event of a change of control of either party to certain of these joint ventures and other strategic alliances, certain consequences may result including automatic termination and liquidation of the venture, exercise of "put" or "call" rights of ownership by the non-acquired partner, termination or transfer of technology license rights to the non-acquired partner and increases in component transfer prices to the acquired partner. We will continue to evaluate joint venture and partnership opportunities in order to penetrate new markets, develop new products and generate manufacturing and operational efficiencies.

Financial information about our investments in joint ventures and alliances is incorporated by reference from Note 3, "INVESTMENTS IN EQUITY INVESTEES," to the *Consolidated Financial Statements.*

Our equity income from these investees was as follows:

	Years ended December 31,					
In millions	**2021**		**2020**		**2019**	
Manufacturing entities						
Beijing Foton Cummins Engine Co., Ltd.	**$ 112**	**26 %**	$ 113	30 %	$ 60	22 %
Dongfeng Cummins Engine Company, Ltd.	**82**	**19 %**	63	17 %	52	19 %
Chongqing Cummins Engine Company, Ltd.	**39**	**9 %**	35	9 %	41	15 %
All other manufacturers	**149**	**36 %**	134 (1)(2)	35 %	88	33 %
Distribution entities						
Komatsu Cummins Chile, Ltda.	**32**	**8 %**	31	8 %	28	10 %
All other distributors	**10**	**2 %**	2	1 %	2	1 %
Cummins share of net income[3]	**$ 424**	**100 %**	$ 378	100 %	$ 271	100 %

[1] Includes $37 million in favorable adjustments related to tax changes within India's 2020-2021 Union Budget of India (India Tax Law Change) passed in March 2020. See NOTE 4, "INCOME TAXES," to our *Consolidated Financial Statements* for additional information on India Tax Law Change.

[2] Includes impairment charges of $13 million and loss on sale of business of $8 million for a joint venture in the Power Systems segment.

[3] This total represents our share of net income of our equity investees and is exclusive of royalties and interest income from our equity investees. To see how this amount reconciles to "Equity, royalty and interest income from investees" in the *Consolidated Statements of Net Income*, see Note 3, "INVESTMENTS IN EQUITY INVESTEES," to our *Consolidated Financial Statements* for additional information.

Manufacturing Entities

Our manufacturing joint ventures were generally formed with customers and are primarily intended to allow us to increase our market penetration in geographic regions, reduce capital spending, streamline our supply chain management and develop technologies. Our largest manufacturing joint ventures are based in China and are included in the list below. Our engine manufacturing joint ventures are supplied by our Components segment in the same manner as it supplies our wholly-owned Engine segment and Power Systems segment manufacturing facilities. Our Components segment joint ventures and wholly-owned entities provide electronics, fuel systems, filtration, aftertreatment systems, turbocharger products and automated transmissions that are used with our engines as well as some competitors' products. The results and investments in our joint ventures in which we have 50 percent or less ownership interest (except for Eaton Cummins Automated Transmission Technologies joint venture, which is consolidated due to our majority voting interest) discussed below are included in “Equity, royalty and interest income from investees” and “Investments and advances related to equity method investees” in our *Consolidated Statements of Net Income* and *Consolidated Balance Sheets*, respectively.

- ***Beijing Foton Cummins Engine Co., Ltd.*** **-**Beijing Foton Cummins Engine Co., Ltd. is a joint venture in China with Beiqi Foton Motor Co., Ltd., a commercial vehicle manufacturer, which has two distinct lines of business - a light-duty business and a heavy-duty business. The light-duty business produces our families of ISF 2.5 liter to 4.5 liter high performance light-duty diesel engines in Beijing. These engines are used in light-duty and medium-duty commercial trucks, pick-up trucks, buses, multipurpose and sport utility vehicles with main markets in China, Brazil and Russia. Certain types of small construction equipment and industrial applications are also served by these engine families. The heavy-duty business produces the X11, X12, X13 and X15, ranging from 10.5 liter to 14.5 liter, high performance heavy-duty diesel engines and natural gas engines in Beijing. Certain types of construction equipment and industrial applications are also served by these engine families.

- ***Dongfeng Cummins Engine Company, Ltd. -*** Dongfeng Cummins Engine Company, Ltd. (DCEC) is a joint venture in China with Dongfeng Automotive Co. Ltd., a subsidiary of Dongfeng Motor Corporation and one of the largest medium-duty and heavy-duty truck manufacturers in China. DCEC produces 3.9 liter to 14.5 liter diesel engines with a power range from 80 to 760 horsepower, natural gas engines and automated transmissions. On-highway engines are used in multiple applications in light-duty and medium-duty trucks, special purpose vehicles, buses and heavy-duty trucks with a main market in China. Off-highway engines are used in a variety of construction, power generation, marine and agriculture markets in China.
- ***Chongqing Cummins Engine Company, Ltd. -*** Chongqing Cummins Engine Company, Ltd. is a joint venture in China with Chongqing Machinery and Electric Co. Ltd. This joint venture manufactures several models of our heavy-duty and high-horsepower diesel engines primarily serving the industrial and stationary power markets in China.

Our joint venture agreement for Cummins Westport, Inc. expired on December 31, 2021, and will not be renewed. Beginning in January 2022, engines previously sold through the joint venture will now be included in our consolidated results.

Distribution Entity

Komatsu Cummins Chile, Ltda. - Komatsu Cummins Chile, Ltda. is a joint venture with Komatsu America Corporation. The joint venture is a distributor that offers the full range of our products and services to customers and end-users in Chile and Peru. See further discussion of our distribution network under the Distribution segment section above.

Non-Wholly-Owned Subsidiaries

We have a majority voting interest in ECJV by virtue of a tie-breaking vote on the joint venture's board of directors. ECJV develops and supplies automated transmissions for the heavy-duty commercial vehicle market.

We have a controlling interest in Cummins India Ltd. (CIL), which is a publicly listed company on various stock exchanges in India. CIL produces medium-duty, heavy-duty and high-horsepower diesel engines, generators for the Indian and export markets and natural gas spark-ignited engines for power generation, automotive and industrial applications. CIL also has distribution and power generation operations.

We have a controlling interest in Hydrogenics Corporation (Hydrogenics), which is consolidated in the New Power segment. Hydrogenics is a developer and manufacturer of proton exchange membrane fuel cell products as well as alkaline and proton exchange membrane electrolyzer solutions.

SUPPLY

The performance of the end-to-end supply chain, extending through to our suppliers, is foundational to our ability to meet customers' expectations and support long-term growth. We are committed to having a robust strategy for how we select and manage our suppliers to enable a market focused supply chain. This requires us to continuously evaluate and upgrade our supply base, as necessary, as we strive to ensure we are meeting the needs of our customers.

We use a combination of proactive and reactive methodologies to enhance our understanding of supply base risks, which guide the development of risk monitoring and sourcing strategies. Our category strategy process (a process designed to create the most value for the company) supports the review of our long-term needs and guides decisions on what we make internally and what we purchase externally. For the items we decide to purchase externally, the strategies also identify the suppliers we should partner with long-term to provide the best technology, the lowest total cost and highest supply chain performance. We design and/or manufacture our strategic components used in or with our engines and power generation units and New Power products. Key suppliers are managed through long-term supply agreements that secure capacity, delivery, quality and cost requirements are met over an extended period.

Other important elements of our sourcing strategy include:

- selecting and managing suppliers to comply with our Supplier Code of Conduct and
- assuring our suppliers comply with our prohibited and restricted materials policy.

As we adjust to the recovery from the COVID-19 pandemic and the rapid return of demand in many manufacturing industries, we are experiencing supply chain disruptions, incremental costs and related challenges throughout the supply chain. We continue to monitor the supply chain disruptions utilizing early detection technology complemented by structured supplier risk and resiliency assessments. We increased frequency of formal and informal supplier engagement to address potentially impactful supply base constraints and enhanced collaboration to develop specific countermeasures to mitigate risks. Our global team, located in different regions of the world, uses various approaches to identify and resolve threats to supply continuity.

PATENTS AND TRADEMARKS

We own or control a significant number of patents and trademarks relating to the products we manufacture. These patents and trademarks were granted and registered over a period of years. Although these patents and trademarks are generally considered beneficial to our operations, we do not believe any patent, group of patents or trademark (other than our leading brand house trademarks) is significant to our business.

SEASONALITY

While individual product lines may experience modest seasonal variation in production, there is no material effect on the demand for the majority of our products on a quarterly basis with the exception that our Power Systems segment normally experiences seasonal declines in the first quarter due to general declines in construction spending during this period.

LARGEST CUSTOMERS

We have thousands of customers around the world and have developed long-standing business relationships with many of them. PACCAR is our largest customer, accounting for 15 percent of our consolidated net sales in 2021, 15 percent in 2020 and 17 percent in 2019. We have long-term supply agreements with PACCAR for our heavy-duty and medium-duty engines and aftertreatment systems. While a significant number of our sales to PACCAR are under long-term supply agreements, these agreements provide for particular engine requirements for specific vehicle models and not a specific volume of engines or aftertreatment systems. PACCAR is our only customer accounting for more than 10 percent of our net sales in 2021. The loss of this customer or a significant decline in the production level of PACCAR vehicles that use our engines would have an adverse effect on our results of operations and financial condition. We have supplied engines to PACCAR for 77 years. A summary of principal customers for each operating segment is included in our segment discussion.

In addition to our agreement with PACCAR, we have long-term heavy-duty and medium-duty engine and aftertreatment system supply agreements with Navistar and Daimler. We also have an agreement with Stellantis to supply engines for its Ram trucks. Collectively, our net sales to these four customers, including PACCAR, were 33 percent of our consolidated net sales in 2021, 32 percent in 2020 and 37 percent in 2019. Excluding PACCAR, net sales to any single customer were less than 8 percent of our consolidated net sales in 2021, less than 7 percent in 2020 and less than 9 percent in 2019. These agreements contain standard purchase and sale agreement terms covering engine, aftertreatment and engine parts pricing, quality and delivery commitments, as well as engineering product support obligations. The basic nature of our agreements with OEM customers is that they are long-term price and operations agreements that help prove for the availability of our products to each customer through the duration of the respective agreements. Agreements with most OEMs contain bilateral termination provisions giving either party the right to terminate in the event of a material breach, change of control or insolvency or bankruptcy of the other party.

BACKLOG

As we adjust to the recovery from the COVID-19 pandemic and the rapid return of demand in many manufacturing industries, we are experiencing supply chain disruptions, incremental costs and related challenges throughout the supply chain. The supply chain disruptions are impacting our business as well as our suppliers and customers resulting in longer lead times in some of our businesses. We have supply agreements with some truck and off-highway equipment OEMs, however most of our business is transacted through open purchase orders. These open orders are historically subject to month-to-month releases and are subject to cancellation on reasonable notice without cancellation charges and therefore are not considered firm. We are working closely with our suppliers as discussed in the Supply section above as well as with customers to meet the demand and work through backlogs as efficiently as possible.

RESEARCH AND DEVELOPMENT

In 2021, we continued to invest in future critical technologies and products. We will continue to make investments to develop new products and improve our current technologies to meet future emission requirements around the world and improve fuel economy performance of diesel and natural gas-powered engines and related components as well as development activities around fully electric, hybrid and hydrogen power solutions and hydrogen production.

Our research and development programs are focused on product improvements, product extensions, innovations and cost reductions for our customers. Research and development expenditures include salaries, contractor fees, building costs, utilities, testing, technical information technology expenses, administrative expenses and allocation of corporate costs and are expensed, net of contract reimbursements, when incurred. From time to time, we enter into agreements with customers and government agencies to fund a portion of the research and development costs of a particular project. When not associated with a sales contract, we generally account for these reimbursements as an offset to the related research and development expenditure. Research and development expenses, net of contract reimbursements, were $1.1 billion in 2021, $903 million in 2020 and $998 million in 2019. Contract reimbursements were $104 million, $86 million and $90 million in 2021, 2020 and 2019, respectively.

ENVIRONMENTAL SUSTAINABILITY

We are committed to making people's lives better by powering a more prosperous world. That prosperity includes strong communities, robust business and environmental sustainability.

The highest level of accountability for our climate-related risks and opportunities is with the Safety, Environment and Technology (SET) Committee of the Board of Directors (the Board). The internal Action Committee for Environmental Sustainability meets monthly and reports to the Chairman and to the SET Committee at least annually.

In late 2019, we introduced PLANET 2050, a sustainability strategy focused on three priority areas: addressing climate change and air emissions, using natural resources in the most sustainable way and improving communities. Additional commitments followed in 2021 with Cummins Water Works, which is our multi-million dollar program for strengthening communities through sustainable water and addressing the global water crisis. The PLANET 2050 strategy includes nine specific goals to achieve by 2030, including science-based carbon dioxide reduction targets for newly sold products and facilities, as well as aspirational targets for 2050. We are currently evaluating how the new goals will be integrated into business planning and will report on progress beginning in 2022. Key areas of focus in 2021 included product decarbonization pathways, customer sustainability collaboration and circular economy efforts such as incorporating expanded lifecycle analysis tools.

The nine PLANET 2050 goals for 2030 are as follows:

- Reduce absolute greenhouse gas (GHG) emissions from facilities and operations by 50 percent.
- Reduce scope three absolute lifetime GHG emissions from newly sold products by 25 percent.
- Partner with customers to reduce scope three GHG emissions from products in the field by 55 million metric tons.
- Reduce volatile organic compounds emissions from paint and coating operations by 50 percent.
- Create a circular lifecycle plan for every part to use less, use better, use again.
- Generate 25 percent less waste in facilities and operations as percent of revenue.
- Reuse or responsibly recycle 100 percent of packaging plastics and eliminate single-use plastics in dining facilities, employee amenities and events.
- Reduce absolute water consumption in facilities and operations by 30 percent.
- Produce net water benefits that exceed our annual water use in all our regions.

The most recent Sustainability Progress Report, prior reports and a Data Book of more detailed environmental data in accordance with the Global Reporting Initiative's Standard core compliance designation is available on our website at www.cummins.com. Our annual submission to the Carbon Disclosure Project (CDP) for climate change and water are also available on the website. The climate submission provides information on our scenario planning for climate and other risks and detailed facility emissions data as requested by CDP. In 2021, we published our second report in accordance with the Sustainability Accounting Standards Board as well as our first report following the framework of the Task Force on Climate-Related Financial Disclosures. These reports and data book are not incorporated into this Form 10-K by reference.

We continue to articulate our positions on key public policy issues and on a wide range of environmental issues. We are actively engaged around the world to promote science-based climate policies by working with regulatory, industry and other stakeholders, including joining advocacy groups and testifying before legislators and regulators. We will continue to work in partnership with others to advocate for tough, clear and enforceable regulations around the globe to address air and GHG emissions. In 2021, we were named to the S&P Dow Jones World and North American Sustainability Indices. It was the sixteenth consecutive time we were named to the North American index and the first time we were named to the world index since 2013. We were also named one of the inaugural recipients of the Prince Charles' Terra Carta Seal, recognizing companies for their leadership in climate action and sustainability.

We were named to Investor Business Daily's Best ESG Companies list for performance on environmental, social and governance matters, ranking number 37. We were also ranked number 84 among Barron's Top 100 Most Sustainable Companies.

ENVIRONMENTAL COMPLIANCE

Product Certification and Compliance

Our engines are subject to extensive statutory and regulatory requirements that directly or indirectly impose standards governing emissions and noise. Over the past several years we have increased our global environmental compliance presence and expertise to understand and meet emerging product environmental regulations around the world. Our ability to comply with these and future emission standards is an essential element in maintaining our leadership position in regulated markets. We made, and will continue to make, significant capital and research expenditures to comply with these standards.

We strive to be a leader in developing and implementing technologies that provide customers with the highest performing products while minimizing the impact on the environment, and we have a long history of working with governments and regulators to achieve these goals. We remain committed to ensuring our products meet all current and future emission standards and delivering value to our customers.

Formed in 2019, the Product Compliance and Regulatory Affairs team leads both engine emissions certification and compliance and regulatory affairs initiatives and is overseen and reports directly to the SET Committee of the Board at least annually. This organization is led by the Vice President - Product Compliance and Regulatory Affairs who reports directly to the Chief Executive Officer. The Vice President is a member of both the Cummins Executive Team and Cummins Leadership Team. The focus of this organization is to strengthen our ability to design great products that help our customers win while complying with increasingly challenging global emission regulations. The organization also works to enhance our collaboration with the agencies setting the direction and regulations of emissions as we strive to meet every expectation today while planning for future changes.

Following conversations with the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) regarding certification for the engines in the 2019 RAM 2500 and 3500 trucks, we made the decision to review our certification process and compliance with emission standards. This review is being conducted with external advisers as we strive to ensure the certification and all of our processes for our pick-up truck applications are consistent with our internal policies, engineering standards and applicable laws. We are working closely with the regulators to enhance our emissions systems to improve the effectiveness of all of our pick-up truck applications and to fully address the regulators' requirements. Based on discussions with the regulators, we have developed a new calibration for the engines in model year 2019 RAM 2500 and 3500 trucks that has been included in all engines shipped since September 2019. During our discussions, the regulators turned their attention to other model years and other engines, most notably our pick-up truck applications for RAM 2500 and 3500 trucks for model years 2013 through 2018. We will continue to work together closely with the relevant regulators to develop and implement recommendations for improvement as part of our ongoing commitment to compliance. See Note 14, "COMMITMENTS AND CONTINGENCIES," to the *Consolidated Financial Statements* for additional information.

Engine Certifications

Our engines are certified globally through various categories within on-highway and off-highway applications. Regulations in these categories typically control nitrogen oxides (NOx), particulate matter (PM) and GHG. The current on-highway NOx and PM emission standards came into effect in India on April 1, 2020, (Bharat Stage VI), China on July 1, 2019, (National Standard NS VI), the European Union (EU) on January 1, 2013, (Euro VI) and on January 1, 2010, for the EPA. To meet these regulations, mid-range and heavy-duty engines for India, China, EU and EPA require NOx aftertreatment. NOx reduction is achieved by an integrated technology solution comprised of the XPI High Pressure Common Rail fuel system, SCR technology (in some cases), next-generation cooled EGR, advanced electronic controls, proven air handling and the Cummins Diesel Particulate Filter (DPF). The Ministry of Road Transport and Highways, Ministry of Ecology and Environment, EU, EPA and CARB certified that our engines meet the current emission requirements. Emission standards in international markets, including Japan, Mexico, Australia, Brazil and Russia are becoming more stringent. We believe that our experience in meeting the EU and EPA emission standards leaves us well positioned to take advantage of opportunities in these markets as the need for emission control capability grows.

In 2013, we certified to EPA's first ever GHG regulations for on-highway medium and heavy-duty engines. Additionally, the EPA's 2013 regulations added the requirement of on-board diagnostics, which were introduced on the ISX 15 in 2010, across the full on-highway product line while maintaining the same near-zero emission levels of NOx and PM required in 2010. On-board diagnostics provide enhanced service capability with standardized diagnostic trouble codes, service tool interface, in-cab warning lamp and service information availability. The new GHG and fuel-efficiency regulations were required for all heavy-duty diesel and natural gas engines beginning in January 2014. Our GHG certification was the first engine certificate issued by the EPA and uses the same proven base engine with the XPI fuel system, variable geometry turbocharger (VGT™) and Cummins aftertreatment system with DPF and SCR technology. Application of these engines and aftertreatment technologies continues in our products that comply with the 2021 GHG regulations.

Our off-highway engines designed for Tier 4 / Stage V standards were based on our extensive on-highway experience developing SCR, high pressure fuel systems, DPF and VGT™. Our products offer low fuel consumption, high torque rise and power output, extended maintenance intervals, reliable and durable operation and a long life to overhaul period, all while meeting the most stringent emission standards in the industrial market. Our off-highway products power multiple applications including construction, mining, marine, agriculture, rail, defense and oil and gas and serve a global customer base. The current EPA Tier 4 off-highway emission standards came into effect between 2013-2015 for all engine power categories. The current EU Stage V off-highway emission standards became effective in 2019 for certain engine power categories and were completely effective January 2021 for all remaining categories.

Other Environmental Statutes and Regulations

Expenditures for environmental control activities and environmental remediation projects at our facilities in the U.S. were not a substantial portion of our annual expenses and are not expected to be material in 2022. We believe we are in compliance in all material respects with laws and regulations applicable to our plants and operations.

In the U.S., pursuant to notices received from federal and state agencies and/or defendant parties in site environmental contribution actions, we were identified as a potentially responsible party under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended or similar state laws, at fewer than 20 waste disposal sites.

Based upon our experiences at similar sites we believe that our aggregate future remediation costs will not be material. We have established accruals that we believe are adequate for our expected future liability with respect to these sites. In addition, we have several other sites where we are working with governmental authorities on remediation projects. The costs for these remediation projects are not expected to be material.

HUMAN CAPITAL RESOURCES

At December 31, 2021, we employed approximately 59,900 persons worldwide. Approximately 21,200 of our employees worldwide are represented by various unions under collective bargaining agreements that expire between 2022 and 2026.

Throughout our company's 100-year history, we always recognized that people drive the strength of our business and our ability to effectively serve our clients and sustain our competitive position. We are focused on harmonizing our approach to talent to provide seamless opportunities and better experiences to our employees around the world. The disruptive events in 2020 and 2021 highlighted the importance for us to complete the strategic work in Human Resources to encourage all employees to reach their full potential. This strategy has key focus areas: creating a diverse and inclusive work environment; engaging employees and their families in improving wellness; developing self-aware and effective leaders; and extending our talent management philosophies in performance management, compensation management, competency building, and access to development opportunities to all employees.

Leadership and Talent Management

Managing our human capital resources is a key focus of the company. In 2020, the Board recast our Compensation Committee as the Talent Management and Compensation Committee to reflect the Board's commitment to overseeing and providing guidance to our leadership team in this important work.

We strive to create a leadership culture that begins with authentic leaders who create an outstanding place to work by encouraging all employees to achieve their full potential. We encourage leaders to connect our people and their work to our mission, vision, values, brand promise and strategies of the company, motivating and giving them a higher sense of purpose. We have developed leadership and employee development programs for employees ranging from the manufacturing floor and technicians through middle management and executive development. When an individual joins Cummins, we are committed to providing both that employee and their manager with the tools and resources to manage their career and navigate in a large global organization. Through our Talent Management strategy our goal is to provide all employees access to the development and career opportunities that a global company enables.

Competitive Pay and Benefits

To attract and retain the best employees, we focus on providing competitive pay and benefits. Our programs target the market for competitiveness and sustainability while ensuring that we honor our core values. We provide benefit programs with the goal of improving physical, mental and financial wellness of our employees throughout their lifetime. Some examples include base and variable pay, medical, paid time off, retirement saving plans and employee stock purchase plans.

When designing our base pay compensation ranges, we do market analysis to be sure ranges are current and our employees are advancing their earning potential. We also do annual compensation studies to assess market movement, pay equity and living wages. For example, in 2018, we conducted a living wage analysis globally as we strive to ensure our employees were making a living wage in the countries they live and work. We incorporated this living wage assessment into our annual compensation structure to work to ensure that current and new hires never fall below this threshold. In the U.S. for example, the living wage in 2019 was $15 per hour, although most positions pay more than that. We review wages globally as we continuously work to ensure we are fair, equitable, competitive and can attract and retain the best talent.

We also provide diverse benefit programs that are aligned with our values and focused on supporting employees and their families based on their unique needs, some of which are: tiered health care cost so that more junior employees pay less for their premiums; paid parental leave for primary and secondary caregivers; advanced medical services from clinicians to support complex health care needs and employee assistance programs with diverse providers that can meet a range of employee needs from race related trauma to financial planning to transgender transition support.

Employee Safety and Wellness

Cummins is committed to being world-class in health and safety. We strive to ensure a workplace with zero incidents. We are committed to removing conditions that cause personal injury or occupational illness and we make decisions and promote behaviors that protect others from risk of injury. We publicly disclose metrics on our rate of recordable injuries, our rate of lost workdays due to injury and the rate of injuries involving contractors.

Our response to the COVID-19 global pandemic illustrated our commitment to safety. To support both our customers and communities, we made keeping employees safe our top priority. Most of our employees who can work from home have done so since the outbreak of the pandemic and we provided them with the tools and support to do so. This allowed us to focus resources and investments on our engineering and production facilities. In those facilities, we have taken many steps to protect the health and safety of our people, including:

- Masks required inside open plants and facilities.
- Redesigned exits, entrances and production lines to encourage social distancing.
- Expanded healthcare and leave programs to support employees and their families.
- Manufacturing our own face masks to provide to our employees free of charge.
- In 2021, we launched an aggressive global effort to acquire vaccines and provide them onsite or near-site to our employees, their families and other stakeholders. By partnering with governments and health care providers, we facilitated the delivery of over 45,000 doses of approved vaccines to employees at or near the workplace. This includes over 5,000 shots in the U.S., over 30,000 shots in India and over 10,000 shots in Mexico.

Diversity, Equity and Inclusion

Diversity, equity and inclusion at all levels of the company are critical to our ability to innovate, to win in the marketplace and to create sustainable success. Having diverse, equitable and inclusive workplaces allows us to attract and retain the best employees to deliver results for our shareholders. This is exemplified by the composition of the Board of which 5 of 13 directors are female and 5 of 13 directors are ethnically diverse. In addition, over 50 percent of our executive team is female, and 45 percent of our leadership team is female. We disclose publicly the percentage of women in supervisory roles and the overall workforce. We also launched several initiatives to increase representation of minorities in the workplace. We created a Global Inclusion Leadership Council to oversee more than 100 employee resource groups around the world to provide opportunities to employees from all backgrounds for leadership training, cross cultural learning and professional development. In 2020, we launched Cummins Advocating for Racial Equity (CARE), which seeks to drive a sustainable impact in dismantling institutional racism and creating systemic equity. CARE now has hundreds of employees engaged and has deployed over $20 million in funding to fight racial injustice in the U.S.

For more information on the topics above and our management of our human capital resources, please go to sustainability.cummins.com. Information from our sustainability report and sustainability webpage is not incorporated by reference into this filing.

AVAILABLE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information electronically with the Securities and Exchange Commission (SEC). The SEC maintains an internet site that contains annual, quarterly and current reports, proxy and information statements and other information that Cummins files electronically with the SEC. The SEC's internet site is www.sec.gov.

Our internet site is www.cummins.com. You can access our Investors and Media webpage through our internet site, by clicking on the heading "About" followed by the "Cummins Inc. Investor Website" link. We make available, free of charge, on or through our Investors and Media webpage, our proxy statements, annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to those reports filed or furnished pursuant to the Securities Exchange Act of 1934 or the Securities Act of 1933, as amended, as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC.

We also have a Corporate Governance webpage. You can access our Governance Documents webpage through our internet site, www.cummins.com, by clicking on the heading "About" followed by "Cummins Inc. Investor Website" then "Board & ESG" and finally the "Governance Documents" link. Code of Conduct, Committee Charters and other governance documents are included at this site. Our Code of Conduct applies to all employees, regardless of their position or the country in which they work. It also applies to the employees of any entity owned or controlled by us. We will post any amendments to the Code of Conduct and any waivers that are required to be disclosed by the rules of either the SEC or the New York Stock Exchange LLC (NYSE), on our internet site. The information on our internet site is not incorporated by reference into this report.

INFORMATION ABOUT OUR EXECUTIVE OFFICERS

Following are the names and ages of our executive officers, their positions with us at January 31, 2022 and summaries of their backgrounds and business experience:

Name and Age	Present Cummins Inc. position and year appointed to position	Principal position during the past five years other than Cummins Inc. position currently held
N. Thomas Linebarger (59)	Chairman of the Board of Directors and Chief Executive Officer (2012)	
Livingston L. Satterthwaite (61)	Vice Chairman (2021)	President and Chief Operating Officer (2019-2021) Vice President and President—Distribution Business (2015-2019)
Jennifer Rumsey (48)	President and Chief Operating Officer (2021)	Vice President and President—Components (2019-2020) Vice President—Chief Technical Officer (2015-2019)
Sherry A. Aaholm (59)	Vice President—Chief Digital Officer (2021)	Vice President—Chief Information Officer (2013-2021)
Sharon R. Barner (64)	Vice President—Chief Administrative Officer and Corporate Secretary (2021)	Vice President—General Counsel and Corporate Secretary (2020-2021) Vice President—General Counsel (2012-2020)
John D. Brockhaus (47)	Vice President—Human Resources Operations (2021)	Vice President—Human Resources Technology and Strategy (2020-2021) Executive Director—Human Resources Strategy (2017-2020) Executive Director—Broad Based and Executive Compensation (2014-2017)
Mary T. Chandler (61)	Vice President—Community Relations and Corporate Responsibility (2016)	Chief Executive Officer—The Cummins Foundation Inc. (2015-present)
Christopher C. Clulow (50)	Vice President—Controller (2017)	Controller—Components (2015-2017)
Jill E. Cook (58)	Vice President—Chief Human Resources Officer (2003)	
Amy R. Davis (52)	Vice President and President—New Power (2020)	Vice President—Cummins Filtration (2018-2020) General Manager—Filtration Business (2015-2018)
Tracy A. Embree (48)	Vice President and President— Distribution Business (2019)	Vice President and President— Components (2015-2019)
Walter J. Fier (57)	Vice President—Chief Technical Officer (2019)	Vice President—Engineering, Engine Business (2015-2019)
Donald G. Jackson (52)	Vice President—Treasury and Tax (2020)	Vice President—Treasurer (2015-2020)
Melina M. Kennedy (52)	Vice President—Product Compliance and Regulatory Affairs (2019)	Executive Director—Pick-up Truck, Engine Business (2018-2019) Executive Director—Rail & Defense (2017-2018) General Manager—Rail & Defense (2014-2017)
Nicole Y. Lamb-Hale (55)	Vice President—General Counsel (2021)	Managing Director and Washington, DC City Leader—Kroll (2020-2021) Managing Director—Kroll (2016-2020)
Mahesh M. Narang (46)	Vice President and President—Components (2021)	Vice President and President—Cummins Emissions Solutions (2017-2021) Vice President and General Manager—Cummins Turbo Technologies (2015-2017)
Earl Newsome (59)	Vice President—Chief Information Officer (2021)	Chief Information Officer, Americas IT—Linde (2019-2021) Global Chief Information Officer and Vice President—Praxair, Inc. (2016-2019)

Norbert Nusterer (53)	Vice President and President—Power Systems (2016)	
Srikanth Padmanabhan (57)	Vice President and President—Engine Business (2016)	
Mark A. Smith (54)	Vice President—Chief Financial Officer (2019)	Vice President—Financial Operations (2016-2019)
Nathan R. Stoner (44)	Vice President—China ABO (2020)	General Manager—Partnerships and EBU China Joint Venture Business (2018-2020) General Manager—Power Systems Business, China (2016-2018)
Jeffrey T. Wiltrout (41)	Vice President—Corporate Strategy (2022)	Executive Director—Corporate Development (2021-2022) Strategy Director—Power Systems Business Unit (2018-2021) Corporate Strategy Director (2016-2018)

Our Chairman and Chief Executive Officer (CEO) is elected annually by the Board and holds office until the meeting of the Board at which his election is next considered. Other officers are appointed by the Chairman and CEO, are ratified by the Board and hold office for such period as the Chairman and CEO or the Board may prescribe.

ITEM 1A. Risk Factors

Set forth below and elsewhere in this Annual Report on Form 10-K are some of the principal risks and uncertainties that could cause our actual business results to differ materially from any forward-looking statements contained in this Report and could individually, or in combination, have a material adverse effect on our results of operations, financial position and cash flows. These risk factors should be considered in addition to our cautionary comments concerning forward-looking statements in this Report, including statements related to markets for our products and trends in our business that involve a number of risks and uncertainties. Our separate section above, "CAUTIONARY STATEMENTS REGARDING FORWARD-LOOKING INFORMATION," should be considered in addition to the following statements.

GOVERNMENT REGULATION

We are conducting a formal internal review of our emission certification process and compliance with emission standards with respect to our pick-up truck applications and are working with the EPA and CARB to address their questions about these applications. Due to the continuing nature of our formal internal review and on-going discussions with the EPA and CARB, we cannot predict the final results of this formal review and these regulatory processes, nor whether, or the extent to which, they could have a material adverse impact on our results of operations and cash flows.

We previously announced that we are conducting a formal internal review of our emissions certification process and compliance with emission standards with respect to all of our pick-up truck applications, following conversations with the EPA and CARB regarding certification of our engines for model year 2019 RAM 2500 and 3500 trucks. During conversations with the EPA and CARB about the effectiveness of our pick-up truck applications, the regulators raised concerns that certain aspects of our emissions systems may reduce the effectiveness of our emissions control systems and thereby act as defeat devices. As a result, our internal review focuses, in part, on the regulators' concerns. We are working closely with the regulators to enhance our emissions systems to improve the effectiveness of all of our pick-up truck applications and to fully address the regulators' requirements. Based on discussions with the regulators, we have developed a new calibration for the engines in model year 2019 RAM 2500 and 3500 trucks that has been included in all engines shipped since September 2019. During our discussions, the regulators turned their attention to other model years and other engines, most notably our pick-up truck applications for RAM 2500 and 3500 trucks for model years 2013 through 2018. We will continue to work together closely with the relevant regulators to develop and implement recommendations for improvement as part of our ongoing commitment to compliance.

Due to the continuing nature of the formal review, our ongoing cooperation with the regulators and the presence of many unknown facts and circumstances, we are not yet able to estimate the financial impact of these matters. It is possible that the consequences of any remediation plans resulting from our formal review and these regulatory processes could have a material adverse impact on our results of operations and cash flows.

Our products are subject to extensive statutory and regulatory requirements that can significantly increase our costs and, along with increased scrutiny from regulatory agencies and unpredictability in the adoption, implementation and enforcement of increasingly stringent and fragmented emission standards by multiple jurisdictions around the world, could have a material adverse impact on our results of operations, financial condition and cash flows.

Our engines are subject to extensive statutory and regulatory requirements governing emissions and noise, including standards imposed by the EPA, the EU, state regulatory agencies (such as the CARB) and other regulatory agencies around the world. Regulatory agencies are making certification and compliance with emissions and noise standards more stringent and subjecting diesel engine products to an increasing level of scrutiny. The discovery of noncompliance issues could have a material adverse impact on our results of operations, financial condition and cash flows.

Developing engines and components to meet more stringent and changing regulatory requirements, with different implementation timelines and emission requirements, makes developing engines efficiently for multiple markets complicated and could result in substantial additional costs that may be difficult to recover in certain markets. While we have met previous deadlines, our ability to comply with existing and future regulatory standards will be essential for us to maintain our competitive position in the engine applications and industries we serve. The successful development and introduction of new and enhanced products in order to comply with new regulatory requirements are subject to other risks, such as delays in product development, cost over-runs and unanticipated technical and manufacturing difficulties.

In addition to these risks, the nature and timing of government implementation and enforcement of increasingly stringent emission standards in our worldwide markets are unpredictable and subject to change. Any delays in implementation or enforcement could result in a loss of our competitive advantage and could have a material adverse impact on our results of operations, financial condition and cash flows.

We operate our business on a global basis and changes in international, national and regional trade laws, regulations and policies affecting and/or restricting international trade could adversely impact the demand for our products and our competitive position.

We manufacture, sell and service products globally and rely upon a global supply chain to deliver the raw materials, components, systems and parts that we need to manufacture and service our products. Changes in laws, regulations and government policies on foreign trade and investment can affect the demand for our products and services, cause non-U.S. customers to shift preferences toward domestically manufactured or branded products and impact the competitive position of our products or prevent us from being able to sell products in certain countries. Our business benefits from free trade agreements, such as the United States-Mexico-Canada Agreement and the U.S. trade relationship with China, Brazil and France and efforts to withdraw from, or substantially modify such agreements or arrangements, in addition to the implementation of more restrictive trade policies, such as more detailed inspections, higher tariffs (including, but not limited to, additional tariffs on the import of steel or aluminum and imposition of new or retaliatory tariffs against certain countries, including based on developments in U.S., China and Russia relations), import or export licensing requirements and exchange controls or new barriers to entry, could limit our ability to capitalize on current and future growth opportunities in international markets, impair our ability to expand the business by offering new technologies, products and services, and could adversely impact our production costs, customer demand and our relationships with customers and suppliers. Any of these consequences could have a material adverse effect on our results of operations, financial condition and cash flows.

Embargoes, sanctions and export controls imposed by the U.S. and other governments restricting or prohibiting transactions with certain persons or entities, including financial institutions, to certain countries or regions, or involving certain products, limit the sales of our products. Embargoes, sanctions and export control laws are changing rapidly for certain geographies, including with respect to China and Russia. In particular, changing U.S. export controls and sanctions on China, as well as other restrictions affecting transactions involving China and Chinese parties and Russian and Russian parties, could affect our ability to collect receivables, provide aftermarket and warranty support for our products, sell products and otherwise impact our reputation and business, any of which could have a material adverse effect on our results of operations, financial condition and cash flows.

The U.S. government's pending rules and regulations concerning mandatory COVID-19 vaccination of U.S.-based employees of companies that work on or in support of federal contracts could materially and adversely affect our results of operations, financial condition and cash flows.

On September 9, 2021, President Biden issued an executive order requiring all employers with U.S. government contracts to ensure that their U.S.-based employees, contractors and subcontractors, that work on or in support of U.S. government contracts, are fully vaccinated against COVID-19 as required by the executive order. The executive order includes on-site and remote U.S.-based employees, contractors and subcontractors and provides for limited medical and religious exceptions. As of December 2021, the executive order has been put on hold by numerous federal courts, pending a final outcome by one or more federal appellate courts and possibly the U.S. Supreme Court. In the meantime, we continue to track the status of our federal contracts and otherwise prepare for the possible implementation of the order.

It is currently not possible to predict with certainty the impact the executive order will have on our workforce if it survives the legal challenges. Additional vaccine mandates may be announced in jurisdictions in which our businesses operate. Our implementation of these requirements may result in attrition, including attrition of critically skilled labor, and difficulty securing future labor needs, which could materially and adversely affect our results of operations, financial condition and cash flows.

Unanticipated changes in our effective tax rate, the adoption of new tax legislation or exposure to additional income tax liabilities could adversely affect our profitability.

We are subject to income taxes in the U.S. and numerous international jurisdictions. Our income tax provision and cash tax liability in the future could be adversely affected by the adoption of new tax legislation, changes in earnings in countries with differing statutory tax rates, changes in the valuation of deferred tax assets and liabilities and the discovery of new information in the course of our tax return preparation process. The carrying value of deferred tax assets, which are predominantly in the U.S., is dependent on our ability to generate future taxable income in the U.S. We are also subject to ongoing tax audits. These audits can involve complex issues, which may require an extended period of time to resolve and can be highly judgmental. Tax authorities may disagree with certain tax reporting positions taken by us and, as a result, assess additional taxes against us. We regularly assess the likely outcomes of these audits in order to determine the appropriateness of our tax provision. The amounts ultimately paid upon resolution of these or subsequent tax audits could be materially different from the amounts previously included in our income tax provision and, therefore, could have a material impact on our tax provision.

Our global operations are subject to laws and regulations that impose significant compliance costs and create reputational and legal risk.

Due to the international scope of our operations, we are subject to a complex system of commercial and trade regulations around the world. Recent years have seen an increase in the development and enforcement of laws regarding trade compliance and anticorruption, such as the U.S. Foreign Corrupt Practices Act and similar laws from other countries, as well as new regulatory requirements regarding data privacy, such as the European Union General Data Protection Regulation. Our numerous foreign subsidiaries, affiliates and joint venture partners are governed by laws, rules and business practices that differ from those of the U.S. The activities of these entities may not comply with U.S. laws or business practices or our Code of Business Conduct. Violations of these laws may result in severe criminal or civil sanctions, could disrupt our business and result in an adverse effect on our reputation, business and results of operations, financial condition and cash flows. We cannot predict the nature, scope or effect of future regulatory requirements to which our operations might be subject or the manner in which existing laws might be administered or interpreted.

Our operations are subject to increasingly stringent environmental laws and regulations.

Our plants and operations are subject to increasingly stringent environmental laws and regulations in all of the countries in which we operate, including laws and regulations governing air emission, discharges to water and the generation, handling, storage, transportation, treatment and disposal of waste materials. While we believe that we are in compliance in all material respects with these environmental laws and regulations, there can be no assurance that we will not be adversely impacted by costs, liabilities or claims with respect to existing or subsequently acquired operations, under either present laws and regulations or those that may be adopted or imposed in the future. We are also subject to laws requiring the cleanup of contaminated property. If a release of hazardous substances occurs at or from any of our current or former properties or at a landfill or another location where we have disposed of hazardous materials, we may be held liable for the contamination and the amount of such liability could be material.

Future bans or limitations on the use of diesel-powered vehicles or other applications could have a material adverse impact on our business over the long term.

In an effort to limit greenhouse gas emissions and combat climate change, multiple countries and cities have announced that they plan to implement a ban on the use in their countries or cities of diesel-powered products in the near or distant future. These countries include China, India and Germany. In addition, California government officials have called for the state to phase out sales of certain diesel-powered vehicles by 2035. To the extent that these types of bans are actually implemented in the future on a broad basis, or in one or more of our key markets, our diesel business over the long-term could experience material adverse impacts.

BUSINESS CONDITIONS / DISRUPTIONS

We are vulnerable to raw material, transportation and labor price fluctuations and supply shortages, which impacted and could continue to impact our results of operations, financial condition and cash flows.

We are experiencing supply chain disruptions and related challenges throughout the supply chain. We single source a significant number of parts and raw materials critical to our business operations. Any delay in our suppliers' deliveries may adversely affect our operations at multiple manufacturing locations, forcing us to seek alternative supply sources to avoid serious disruptions. Delays may be caused by factors affecting our suppliers (including the COVID-19 pandemic, capacity constraints, port congestion, labor disputes, economic downturns, availability of credit or impaired financial condition), suppliers' allocations to other purchasers, weather emergencies, natural disasters, acts of government or acts of war or terrorism. In particular, if the COVID-19 pandemic continues and results in extended periods of travel, commercial and other restrictions, we could continue to incur global supply disruptions. Any extended delay in receiving critical supplies could impair our ability to deliver products to our customers and have a material adverse effect on our results of operations, financial condition and cash flows.

In addition, the current economic environment has resulted, and may continue to result, in price volatility and inflation of many of our raw material, transportation and other costs. Further, the labor market for skilled manufacturing remains tight as the U.S. economy recovers after the COVID-19 pandemic shutdowns, and our labor costs have increased as a result. Material, transportation, labor and other cost inflation has impacted and could continue to impact our results of operations, financial condition and cash flows.

We face the challenge of accurately aligning our capacity with our demand.

Our markets are cyclical in nature and we face periods when demand fluctuates significantly higher or lower than our normal operating levels, including variability driven by supply chain inconsistency. Accurately forecasting our expected volumes and appropriately adjusting our capacity are important factors in determining our results of operations and cash flows. We manage our capacity by adjusting our manufacturing workforce, capital expenditures and purchases from suppliers. In periods of weak demand we may face under-utilized capacity and un-recovered overhead costs, while in periods of strong demand we may experience unplanned costs and could fail to meet customer demand. We cannot guarantee that we will be able to adequately adjust our manufacturing capacity in response to significant changes in customer demand, which could harm our business. If we do not accurately align our manufacturing capabilities with demand it could have a material adverse effect on our results of operations, financial condition and cash flows.

We derive significant earnings from investees that we do not directly control, with more than 50 percent of these earnings from our China-based investees.

For 2021, we recognized $506 million of equity, royalty and interest income from investees, compared to $452 million in 2020.Approximately half of our equity, royalty and interest income from investees is from three of our 50 percent owned joint ventures in China - Beijing Foton Cummins Engine Co., Ltd., Dongfeng Cummins Engine Company, Ltd. and Chongqing Cummins Engine Company, Ltd. Although a significant percentage of our net income is derived from these unconsolidated entities, we do not unilaterally control their management or their operations, which puts a substantial portion of our net income at risk from the actions or inactions of these entities. A significant reduction in the level of contribution by these entities to our net income would likely have a material adverse effect on our results of operations and cash flows.

Our truck manufacturers and OEM customers discontinuing outsourcing their engine supply needs, financial distress, particularly related to bankruptcy or a change-in-control of one of our large truck OEM customers, could have a material adverse impact on our results of operations, financial condition and cash flows.

We recognize significant sales of engines and components to a few large on-highway truck OEM customers which have been an integral part of our positive business results for several years. Many are truck manufacturers or OEMs that manufacture engines for some of their own vehicles. Despite their own engine manufacturing abilities, these customers have historically chosen to outsource certain types of engine production to us due to the quality of our engine products, our emission compliance capabilities, our systems integration, their customers' preferences, their desire for cost reductions, their desire for eliminating production risks and their desire to maintain company focus. However, there can be no assurance that these customers will continue to outsource, or outsource as much of, their engine production in the future. In addition, increased levels of OEM vertical integration could result from a number of factors, such as shifts in our customers' business strategies, acquisition by a customer of another engine manufacturer, the inability of third-party suppliers to meet product specifications and the emergence of low-cost production opportunities in foreign countries. Any significant reduction in the level of engine production outsourcing from our truck manufacturer or OEM customers, financial distress of one of our large truck OEM customers due to bankruptcy or a change-in-control, could likely lead to significant reductions in our sales volumes, commercial disputes, receivable collection issues, and other negative consequences that could have a material adverse impact on our results of operations, financial condition and cash flows.

PRODUCTS AND TECHNOLOGY

Our products are subject to recall for performance or safety-related issues.

Our products are subject to recall for performance or safety-related issues. Product recalls subject us to reputational risk, loss of current and future customers, reduced revenue and product recall costs. Product recall costs are incurred when we decide, either voluntarily or involuntarily, to recall a product through a formal campaign to solicit the return of specific products due to known or suspected performance or safety issues. Any significant product recalls could have material adverse effects on our results of operations, financial condition and cash flows. See Note 13, "PRODUCT WARRANTY LIABILITY" to the *Consolidated Financial Statements* for additional information.

Our products are exposed to variability in material and commodity costs.

Our businesses establish prices with our customers in accordance with contractual time frames; however, the timing of material and commodity market price increases may prevent us from passing these additional costs on to our customers through timely pricing actions. Additionally, higher material and commodity costs around the world may offset our efforts to reduce our cost structure. While we customarily enter into financial transactions and contractual pricing adjustment provisions with our customers that attempt to address some of these risks (notably with respect to copper, platinum and palladium), there can be no assurance that commodity price fluctuations will not adversely affect our results of operations and cash flows. In addition, while the use of commodity price hedging instruments and contractual pricing adjustments may provide us with some protection from adverse fluctuations in commodity prices, by utilizing these instruments, we potentially forego the benefits that might result from favorable fluctuations in price. As a result, higher material and commodity costs, as well as hedging these commodity costs during periods of decreasing prices, could result in declining margins.

The development of new technologies may materially reduce the demand for our current products and services.

We are investing in new products and technologies, including electrified powertrains, hydrogen production and fuel cells, for planned introduction into certain new and existing markets. Given the early stages of development of some of these new products and technologies, there can be no guarantee of the future market acceptance and investment returns with respect to our planned products, which will face competition from an array of other technologies and manufacturers. The increased adoption of electrified powertrains in some market segments could result in lower demand for current diesel or natural gas engines and components and, over time, reduce the demand for related parts and service revenues from diesel or natural gas powertrains. Furthermore, it is possible that we may not be successful in developing segment-leading electrified or alternate fuel powertrains and some of our existing customers could choose to develop their own, or source from other manufacturers, and any of these factors could have a material adverse impact on our results of operations, financial condition and cash flows.

Lower-than-anticipated market acceptance of our new or existing products or services could have a material adverse impact on our results of operations, financial condition and cash flows.

Although we conduct market research before launching new or refreshed engines and introducing new services, many factors both within and outside our control affect the success of new or existing products and services in the marketplace. Offering engines and services that customers desire and value can mitigate the risks of increasing competition and declining demand, but products and services that are perceived to be less than desirable (whether in terms of price, quality, overall value, fuel efficiency or other attributes) can exacerbate these risks. With increased consumer interconnectedness through the internet, social media and other media, mere allegations relating to poor quality, safety, fuel efficiency, corporate responsibility or other key attributes can negatively impact our reputation or market acceptance of our products or services, even if such allegations prove to be inaccurate or unfounded.

Our business is exposed to potential product liability claims.

We face an inherent business risk of exposure to product liability claims in the event that our products' failure to perform to specification results, or is alleged to result, in property damage, bodily injury and/or death. At any given time, we are subject to various and multiple product liability claims, any one of which, if decided adversely to us, may have a material adverse effect on our reported results of operation in the period in which our liability with respect to any such claim is recognized. While we maintain insurance coverage with respect to certain product liability claims, we may not be able to obtain such insurance on acceptable terms in the future, if at all, and any such insurance may not provide adequate coverage against product liability claims. In addition, product liability claims can be expensive to defend and can divert the attention of management and other personnel for significant periods of time, regardless of the ultimate outcome. Furthermore, even if we are successful in defending against a claim relating to our products, claims of this nature could cause our customers to lose confidence in our products and us.

GENERAL

We may not complete the separation of our filtration business within the time frame we anticipate or at all. The separation may present difficulties that could have an adverse effect on us and/or the independent business resulting from the separation and/or costs associated with the separation may be higher than anticipated. Additionally, if we complete the separation, we may not realize some or all of the expected benefits of the separation.

In August 2021, we announced our exploration of strategic alternatives for our filtration business unit, including the potential separation of the business into a stand-alone company (the “separation”). Any separation would be complex in nature, and unanticipated developments or changes, including changes in law, the macroeconomic environment and market conditions or regulatory or political conditions may affect our ability to complete the separation, within the anticipated time frame or at all.

Whether or not the separation is completed, our businesses may face material challenges in connection with this transaction, including, without limitation:

- the diversion of management’s attention from ongoing business concerns and impact on our businesses as a result of the devotion of management’s attention to strategic alternatives for the filtration business, including the separation;
- maintaining employee morale and retaining key management and other employees;
- retaining existing business and operational relationships, including with customers, suppliers, employees and other counterparties, and attracting new business and operational relationships;
- execution and related risks in connection with financing transactions undertaken in connection with the separation;
- foreseen and unforeseen dis-synergy costs, costs of restructuring transactions (including taxes) and other significant costs and expenses; and
- any potential negative reactions from the financial markets resulting from the separation.

Any of these factors could have a material adverse effect on our business, financial condition, results of operations and cash flows. In addition, if the separation is completed, the new independent company will incur ongoing costs, including costs of operating as an independent company, that the separated business will no longer be able to share. Those costs may exceed our estimates or could diminish the benefits we expect to realize from the separation.

Our plan to reposition our portfolio of product offerings through exploration of strategic acquisitions and divestitures may expose us to additional costs and risks.

Part of our strategic plan is to improve our revenue growth, gross margins and earnings by exploring the repositioning of our portfolio of product line offerings through the pursuit of potential strategic acquisitions and/or divestitures to provide future strategic, financial and operational benefits and improve shareholder value. There can be no assurance that we will be able to identify suitable candidates or consummate these transactions on favorable terms. The successful identification and completion of any strategic transaction depends on a number of factors that are not entirely within our control, including the availability of suitable candidates and our ability to negotiate terms acceptable to all parties involved, conclude satisfactory agreements and obtain all necessary regulatory approvals. Accordingly, we may not be able to successfully negotiate and complete specific transactions. The exploration, negotiation and consummation of strategic transactions may involve significant expenditures by us, which may adversely affect our results of operations at the time such expenses are incurred, and may divert management's attention from our existing business. Strategic transactions also may have adverse effects on our existing business relationships with suppliers and customers.

If required, the financing for strategic acquisitions could result in an increase in our indebtedness, dilute the interests of our shareholders or both. Any acquisition may not be accretive to us for a significant period of time following the completion of such acquisition. Also, our ability to effectively integrate any potential acquisition into our existing business and culture may not be successful, which could jeopardize future financial and operational performance for the combined businesses. In addition, if an acquisition results in any additional goodwill or increase in other intangible assets on our balance sheet and subsequently becomes impaired, we would be required to record a non-cash impairment charge, which could result in a material adverse effect on our financial condition.

Similarly, any strategic divestiture of a product line or business may reduce our revenue and earnings, reduce the diversity of our business, result in substantial costs and expenses and cause disruption to our employees, customers, vendors and communities in which we operate.

We operate in challenging markets for talent and may fail to attract, develop and retain key personnel.

We depend on the skills, institutional knowledge, working relationships, and continued services and contributions of key personnel, including our leadership team and others at all levels of the company, as a critical part of our human capital resources. In addition, our ability to achieve our operating and strategic goals depends on our ability to identify, hire, train and retain qualified individuals. We compete with other companies both within and outside of our industry for talented personnel and we may lose key personnel or fail to attract other talented personnel. Any such loss or failure could have material adverse effects on our results of operations, financial condition and cash flows.

We may be adversely impacted by the effects of climate change and may incur increased costs and experience other impacts due to new or more stringent greenhouse gas regulations designed to address climate change.

The scientific consensus indicates that emissions of greenhouse gases (GHG) continue to alter the composition of Earth's atmosphere in ways that are affecting, and are expected to continue to affect, the global climate. The potential impacts of climate change on our customers, product offerings, operations, facilities and suppliers are accelerating and uncertain, as they will be particular to local and customer-specific circumstances. These potential impacts may include, among other items, physical long-term changes in freshwater availability and the frequency and severity of weather events as well as customer product changes either through preference or regulation.

Concerns regarding climate change may lead to additional international, national, regional and local legislative and regulatory responses. Various stakeholders, including legislators and regulators, shareholders and non-governmental organizations, are continuing to look for ways to reduce GHG emissions. We could face risks to our brand reputation, investor confidence and market share due to an inability to innovate and develop new products that decrease GHG emissions. Increased input costs, such as fuel, utility, transportation and compliance-related costs could increase our operating costs and negatively impact customer operations and demand for our products. As the impact of any future GHG legislative or regulatory requirements on our global businesses and products is dependent on the timing, scope and design of the mandates or standards, we are currently unable to predict its potential impact which could have a material adverse effect on our results of operations, financial condition and cash flows.

Our information technology environment and our products are exposed to potential security breaches or other disruptions which may adversely impact our competitive position, reputation, results of operations, financial condition and cash flows.

We rely on the capacity, reliability and security of our information technology environment and data security infrastructure in connection with various aspects of our business activities. We also rely on our ability to expand and continually update these technologies and related infrastructure in response to the changing needs of our business. As we implement new technologies, they may not perform as expected. We face the challenge of supporting our older technologies and implementing necessary upgrades. In addition, some of these technologies are managed by third-party service providers and are not under our direct control. If we experience a problem with an important technology, including during upgrades and/or new implementations of technologies, the resulting disruptions could have an adverse effect on our business and reputation. As customers adopt and rely on cloud-based digital technologies and services we offer, any disruption of the confidentiality, integrity or availability of those services could have an adverse effect on our business and reputation.

The data handled by our technologies is vulnerable to security threats. Our operations routinely involve receiving, storing, processing and transmitting sensitive information pertaining to our business, customers, dealers, suppliers, employees and other sensitive matters. While we continually work to safeguard our information technology environment and mitigate potential risks, there is no assurance that these actions will be sufficient to prevent information technology security threats, such as security breaches, computer malware, ransomware attacks and other "cyber attacks," which are increasing in both frequency and sophistication, along with power outages or hardware failures. These threats could result in unauthorized public disclosures of information, create financial liability, subject us to legal or regulatory sanctions, disrupt our ability to conduct our business, result in the loss of intellectual property or damage our reputation with customers, dealers, suppliers and other stakeholders. As a result of the COVID-19 pandemic a large percentage of our salaried employees continue to work remotely full or part-time. This remote working environment may pose a heightened risk for security breaches or other disruptions of our information technology environment.

In addition, our products, including our engines, contain interconnected and increasingly complex technologies that control various processes and these technologies are potentially subject to "cyber attacks" and disruption. The impact of a significant information technology event on either our information technology environment or our products could have a material adverse effect on our competitive position, reputation, results of operations, financial condition and cash flows.

We are exposed to political, economic and other risks that arise from operating a multinational business. Greater political, economic and social uncertainty and the evolving globalization of businesses could significantly change the dynamics of our competition, customer base and product offerings and impact our growth globally.

Our business is subject to the political, economic and other risks that are inherent in operating in numerous countries. These risks include:

- public health crises, including the spread of a contagious disease, such as COVID-19, and other catastrophic events;
- the difficulty of enforcing agreements and collecting receivables through foreign legal systems;
- trade protection measures and import or export licensing requirements;
- the imposition of taxes on foreign income and tax rates in certain foreign countries that exceed those in the U.S.;
- the imposition of tariffs, exchange controls or other restrictions;
- difficulty in staffing and managing widespread operations and the application of foreign labor regulations;
- required compliance with a variety of foreign laws and regulations; and
- changes in general economic and political conditions, including changes in relationship with the U.S., in countries where we operate, particularly in China, Russia and emerging markets.

As we continue to operate and grow our business globally, our success will depend, in part, on our ability to anticipate and effectively manage these and other related risks. There can be no assurance that the consequences of these and other factors relating to our multinational operations will not have a material adverse effect upon us.

In addition, there continues to be significant uncertainty about the future relationships between the U.S. and China and the U.S. and Russia, including with respect to trade policies, treaties, government regulations and tariffs. Any increased trade barriers or restrictions on global trade, especially trade with China or Russia, could adversely impact our competitive position, results of operations, financial condition and cash flows.

We face significant competition in the regions we serve.

The markets in which we operate are highly competitive. We compete worldwide with a number of other manufacturers and distributors that produce and sell similar products. We primarily compete with diesel engines and related diesel products; however, new technologies continue to be developed for gasoline, natural gas, hydrogen, electrification and other technologies, and we will continue to face new competition from these expanding technologies. Our products primarily compete on the basis of performance, price, total cost of ownership, fuel economy, emissions compliance, speed of delivery, quality and customer support. We also face competitors in some emerging regions who have established local practices and long standing relationships with participants in these markets. There can be no assurance that our products will be able to compete successfully with the products of other companies and in other markets.

Increasing global competition among our customers may affect our existing customer relationships and restrict our ability to benefit from some of our customers' growth.

As our customers in emerging markets continue to grow in size and scope, they are increasingly seeking to export their products to other countries. This has meant greater demand for our advanced engine technologies to help these customers meet the more stringent emissions requirements of developed markets, as well as greater demand for access to our distribution systems for purposes of equipment servicing. As these emerging market customers enter into, and begin to compete in more developed markets, they may increasingly begin to compete with our existing customers in these markets. Our further aid to emerging market customers could adversely affect our relationships with developed market customers. In addition, to the extent the competition does not correspond to overall growth in demand, we may see little or no benefit from this type of expansion by our emerging market customers.

We may be adversely impacted by work stoppages and other labor matters.

At December 31, 2021, we employed approximately 59,900 persons worldwide. Approximately 21,200 of our employees worldwide were represented by various unions under collective bargaining agreements that expire between 2022 and 2026. While we have no reason to believe that we will be materially impacted by work stoppages or other labor matters, there can be no assurance that future issues with our labor unions will be resolved favorably or that we will not encounter future strikes, work stoppages, or other types of conflicts with labor unions or our employees. Any of these consequences may have an adverse effect on us or may limit our flexibility in dealing with our workforce. In addition, many of our customers and suppliers have unionized work forces. Work stoppages or slowdowns experienced by us, our customers or suppliers could result in slowdowns or closures that would have a material adverse effect on our results of operations, financial condition and cash flow.

We are subject to foreign currency exchange rate and other related risks.

We conduct operations in many areas of the world involving transactions denominated in a variety of currencies. We are subject to foreign currency exchange rate risk to the extent that our costs are denominated in currencies other than those in which we earn revenues. In addition, since our financial statements are denominated in U.S. dollars, changes in foreign currency exchange rates between the U.S. dollar and other currencies have had, and will continue to have, an impact on our results of operations, financial condition and cash flows.

We also face risks arising from the imposition of foreign exchange controls and currency devaluations. Foreign 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. See Management's Discussion and Analysis for additional information.

Significant declines in future financial and stock market conditions could diminish our pension plan asset performance and adversely impact our results of operations, financial condition and cash flow.

We sponsor both funded and unfunded domestic and foreign defined benefit pension and other retirement plans. Our pension cost and the required contributions to our pension plans are directly affected by the value of plan assets, the projected and actual rates of return on plan assets and the actuarial assumptions we use to measure our defined benefit pension plan obligations, including the discount rate at which future projected and accumulated pension obligations are discounted to a present value. We could experience increased pension cost due to a combination of factors, including the decreased investment performance of pension plan assets, decreases in the discount rate and changes in our assumptions relating to the expected return on plan assets.

Significant declines in current and future financial and stock market conditions could cause material losses in our pension plan assets, which could result in increased pension cost in future years and adversely impact our results of operations, financial condition and cash flow. Depending upon the severity and length of market declines and government regulatory changes, we may be legally obligated to make pension payments in the U.S. and perhaps other countries and these contributions could be material.

We are exposed to risks arising from the price and availability of energy.

The level of demand for our products and services is influenced in multiple ways by the price and availability of energy. High energy costs generally drive greater demand for better fuel economy in almost all countries in which we operate. Some of our engine products have been developed with a primary purpose of offering fuel economy improvements, and if energy costs decrease or increase less than expected, demand for these products may likewise decrease. The relative unavailability of electricity in some emerging market countries also influences demand for our electricity generating products, such as our diesel generators. If these countries add energy capacity by expanding their power grids at a rate equal to or faster than the growth in demand for energy, the demand for our generating products could also decrease or increase less than would otherwise be the case.

ITEM 1B. Unresolved Staff Comments

None.

ITEM 2. Properties

Manufacturing Facilities

Our principal manufacturing facilities by segment are as follows:

Segment	U.S. Facilities	Facilities Outside the U.S.
Engine	**Indiana:** Columbus	**Brazil:** Sao Paulo
	New York: Lakewood	**India:** Phaltan
	North Carolina: Whitakers	**U.K.:** Darlington
Components	**Indiana:** Columbus	**Australia:** Kilsyth
	South Carolina: Charleston	**Brazil:** Sao Paulo
	Tennessee: Cookeville	**China:** Shanghai, Wuxi, Wuhan
	Wisconsin: Mineral Point, Neillsville	**France:** Quimper
		Germany: Marktheidenfeld
		India: Pune, Dewas, Pithampur, Phaltan, Rudrapur
		Mexico: Ciudad Juarez, San Luis Potosi
		South Korea: Suwon
		U.K.: Darlington, Huddersfield
Power Systems	**Indiana:** Elkhart, Seymour	**Brazil:** Sao Paulo
	Minnesota: Fridley	**China:** Wuxi, Wuhan
	New Mexico: Clovis	**India:** Pune, Ahmednagar, Ranjangaon, Phaltan
		Mexico: San Luis Potosi
		Romania: Craiova
		U.K.: Daventry
		Nigeria: Lagos
New Power	**Indiana:** Columbus	**Belgium:** Oevel
		Canada: Mississauga
		Germany: Herten

In addition, engines and engine components are manufactured by joint ventures or independent licensees at manufacturing plants in the U.S., China, India, Japan, Sweden, U.K. and Mexico.

Distribution Facilities

The principal distribution facilities that serve all of our segments are as follows:

U.S. Facilities	Facilities Outside the U.S.
Arizona: Avondale	**Australia:** Mackay, Perth
Colorado: Henderson	**China:** Beijing
Minnesota: White Bear Lake	**South Africa:** Johannesburg
Texas: Dallas	**U.K.:** Wellingborough
Utah: West Valley City	

Supply Chain Facilities

The principal supply chain facilities that serve all of our segments are as follows:

U.S. Facilities	Facilities Outside the U.S.
Georgia: Atlanta	**Belgium:** Rumst
Indiana: Columbus, Indianapolis	**China:** Beijing, Shanghai, Wuhan
Kentucky: Walton	**India:** Phaltan, Pithampur, Pune
Pennsylvania: Harrisburg	**Mexico:** San Luis Potosi
South Carolina: Charleston	**U.K.:** Daventry
Tennessee: Memphis	
Texas: Arlington	

Other Facilities

We operate numerous management, research and development, marketing and administrative facilities globally.

ITEM 3. Legal Proceedings

The matters described under "Legal Proceedings" in Note 14, "COMMITMENTS AND CONTINGENCIES," to the *Consolidated Financial Statements* are incorporated herein 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

Our common stock is listed on the NYSE under the symbol "CMI." For other matters related to our common stock and shareholders' equity, see Note 15, "CUMMINS INC. SHAREHOLDERS' EQUITY," to the *Consolidated Financial Statements.*

At December 31, 2021, there were approximately 2,525 holders of record of Cummins Inc.'s $2.50 par value common stock.

The following information is provided pursuant to Item 703 of Regulation S-K:

	Issuer Purchases of Equity Securities			
Period	Total Number of Shares Purchased[(1)]	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs (in millions) [(2)]
October 4 - November 7	263,999	$ 232.40	263,999	$ 704
November 8 - December 5	91,173	221.23	91,173	684
December 6 - December 31	426,672	215.99	426,672	2,592
Total	781,844	222.14	781,844	

(1) Shares purchased represent shares under the Board authorized share repurchase program.

(2) Shares repurchased under our Key Employee Stock Investment Plan only occur in the event of a participant default, which cannot be predicted, and were excluded from this column.

In December 2021, the Board of Directors (the Board) authorized the acquisition of up to $2.0 billion of additional common stock upon completion of the 2019 repurchase plan. In December 2019, the Board authorized the acquisition of up to $2.0 billion of additional common stock upon completion of the 2018 repurchase plan. During the three months ended December 31, 2021, we repurchased $174 million of common stock under the 2019 authorization. The dollar value remaining available for future purchases under the 2019 program at December 31, 2021, was $592 million.

Our Key Employee Stock Investment Plan allows certain employees, other than officers, to purchase shares of common stock on an installment basis up to an established credit limit. We hold participants’ shares as security for the loans and would, in effect, repurchase shares only if the participant defaulted in repayment of the loan. Shares associated with participants' sales are sold as open-market transactions via a third-party broker.

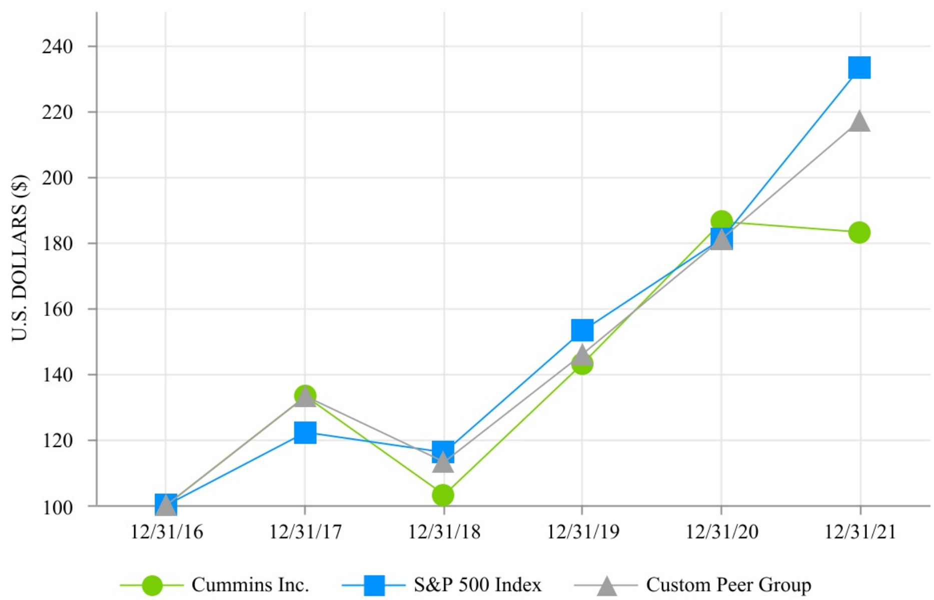
Performance Graph (Unaudited)

The following Performance Graph and related information shall not be deemed "soliciting material" or to be "filed" with the SEC, nor shall such information be incorporated by reference into any of our future filings under the Securities Act of 1933 or Securities Exchange Act of 1934, each as amended, except to the extent that we specifically incorporate it by reference into such filing.

The following graph compares the cumulative total shareholder return on our common stock for the last five years with the cumulative total return on the S&P 500 Index and an index of peer companies selected by us. Our peer group includes BorgWarner Inc., Caterpillar, Inc., Daimler AG, Deere & Company, Donaldson Company Inc., Eaton Corporation, Emerson Electric Co., Fortive Corporation, W.W. Grainger Inc., Honeywell International, Illinois Tool Works Inc., PACCAR, Parker-Hannifin Corporation, Textron Inc. and Volvo AB. Each of the measures of cumulative total return assumes reinvestment of dividends. The comparisons in this table are required by the SEC and are not intended to forecast or be indicative of possible future performance of our stock.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN

AMONG CUMMINS INC., S&P 500 INDEX AND CUSTOM PEER GROUP



ASSUMES $100 INVESTED ON DECEMBER 31, 2016

ASSUMES DIVIDENDS REINVESTED

FISCAL YEAR ENDING DECEMBER 31, 2021

ITEM 6. [Reserved]

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

ORGANIZATION OF INFORMATION

The following Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A) was prepared to provide the reader with a view and perspective of our business through the eyes of management and should be read in conjunction with our *Consolidated Financial Statements* and the accompanying notes to those financial statements. Our MD&A is presented in the following sections:

- **EXECUTIVE SUMMARY AND FINANCIAL HIGHLIGHTS**
- **RESULTS OF OPERATIONS**
- **OPERATING SEGMENT RESULTS**
- **2022 OUTLOOK**
- **LIQUIDITY AND CAPITAL RESOURCES**
- **APPLICATION OF CRITICAL ACCOUNTING ESTIMATES**

The following is the discussion and analysis of changes in the financial condition and results of operations for fiscal year 2021 compared to fiscal year 2020. The discussion and analysis of fiscal year 2019 and changes in the financial condition and results of operations for fiscal year 2020 compared to fiscal year 2019 that are not included in this Form 10-K may be found in Part II, ITEM 7 of our Annual Report on Form 10-K for the fiscal year ended December 31, 2020, filed with the Securities and Exchange Commission (SEC) on February 10, 2021.

EXECUTIVE SUMMARY AND FINANCIAL HIGHLIGHTS

Overview

We are a global power leader that designs, manufactures, distributes and services diesel, natural gas, electric and hybrid powertrains and powertrain-related components including filtration, aftertreatment, turbochargers, fuel systems, controls systems, air handling systems, automated transmissions, electric power generation systems, batteries, electrified power systems, hydrogen production and fuel cell products. We sell our products to original equipment manufacturers (OEMs), distributors, dealers and other customers worldwide. We have long-standing relationships with many of the leading manufacturers in the markets we serve, including PACCAR Inc, Navistar International Corporation, Daimler Trucks North America and Stellantis N.V. We serve our customers through a service network of approximately 500 wholly-owned, joint venture and independent distributor locations and more than 10,000 Cummins certified dealer locations in approximately 190 countries and territories.

Our reportable operating segments consist of Engine, Distribution, Components, Power Systems and New Power. This reporting structure is organized according to the products and markets each segment serves. The Engine segment produces engines (15 liters and smaller) and associated parts for sale to customers in on-highway and various off-highway markets. Our engines are used in trucks of all sizes, buses and recreational vehicles, as well as in various industrial applications, including construction, agriculture, power generation systems and other off-highway applications. The Distribution segment includes wholly-owned and partially-owned distributorships engaged in wholesaling engines, generator sets and service parts, as well as performing service and repair activities on our products and maintaining relationships with various OEMs throughout the world. The Components segment sells filtration products, aftertreatment systems, turbochargers, electronics, fuel systems and automated transmissions. The Power Systems segment is an integrated power provider, which designs, manufactures and sells engines (16 liters and larger) for industrial applications (including mining, oil and gas, marine and rail), standby and prime power generator sets, alternators and other power components. The New Power segment designs, manufactures, sells and supports hydrogen production solutions as well as electrified power systems ranging from fully electric to hybrid along with innovative components and subsystems, including battery and fuel cell technologies. The New Power segment is currently in the development phase with a primary focus on research and development activities for our power systems, components and subsystems. We continue to serve all our markets as they adopt electrification and alternative power technologies, meeting the needs of our OEM partners and end customers.

Our financial performance depends, in large part, on varying conditions in the markets we serve, particularly the on-highway, construction and general industrial markets. Demand in these markets tends to fluctuate in response to overall economic conditions. Our sales may also be impacted by OEM inventory levels, production schedules, stoppages and supply chain challenges. Economic downturns in markets we serve generally result in reduced sales of our products and can result in price reductions in certain products and/or markets. As a worldwide business, our operations are also affected by currency, political, economic, public health crises, epidemics or pandemics and regulatory matters, including adoption and enforcement of environmental and emission standards, in the countries we serve. As part of our growth strategy, we invest in businesses in certain countries that carry high levels of these risks such as China, Brazil, India, Mexico, Russia and countries in the Middle East and Africa. At the same time, our geographic diversity and broad product and service offerings have helped limit the impact from a drop in demand in any one industry or customer or the economy of any single country on our consolidated results.

COVID-19 Update

The outbreak of COVID-19 in early 2020 became a global pandemic with the resultant economic impacts evolving into a worldwide recession. The pandemic triggered a significant downturn in our markets globally, which negatively impacted our sales and results of operations during 2020. While the majority of the negative impacts to demand largely subsided in 2021, we are still experiencing supply chain disruptions and related financial impacts reflected as increased cost of sales. Our industry continues to be unfavorably impacted by supply chain constraints leading to shortages across multiple components categories and limiting our collective ability to meet end-user demand. Our customers are also experiencing other supply chain issues and slowing production. Should the supply chain issues continue for an extended period of time or worsen, the impact on our production and supply chain could have a material adverse effect on our results of operations, financial condition and cash flows. Our Board of Directors (the Board) continues to monitor and evaluate all of these factors and the related impacts on our business and operations, and we are diligently working to minimize the supply chain impacts to our business and to our customers.

2021 Results

A summary of our results is as follows:

	Years ended December 31,		
In millions, except per share amounts	**2021**	**2020**	**2019**
Net sales	**$ 24,021**	$ 19,811	$ 23,571
Net income attributable to Cummins Inc.	**2,131**	1,789	2,260
Earnings per common share attributable to Cummins Inc.			
Basic	**$ 14.74**	$ 12.07	$ 14.54
Diluted	**14.61**	12.01	14.48

Worldwide revenues improved 21 percent in 2021 compared to 2020, as we experienced higher demand in all operating segments and all geographic regions due to an improved economic environment and fewer effects from the COVID-19 pandemic. International demand (excludes the U.S. and Canada) improved by 27 percent compared to 2020, with higher sales in all geographic regions. The increase in international sales was principally due to higher demand in all components businesses (primarily emission solutions in India and Western Europe), industrial (especially mining) and power generation equipment (mainly in China and India), most distribution product lines and most off-highway markets (principally construction markets in Europe, Asia Pacific and China). Favorable foreign currency fluctuations impacted international sales by 3 percent (mainly the Chinese renminbi, Euro and Australian dollar). Net sales in the U.S. and Canada improved by 17 percent primarily due to increased demand in North American on-highway markets, which positively impacted all components businesses.

The following table contains sales and EBITDA (defined as earnings or losses before interest expense, income taxes, depreciation and amortization and noncontrolling interests) by operating segment for the years ended December 31, 2021 and 2020. See Note 22, "OPERATING SEGMENTS," to the *Consolidated Financial Statements* for additional information and a reconciliation of our segment information to the corresponding amounts in our *Consolidated Statements of Net Income*.

In millions	Operating Segments 2021 Sales		2021 Percent of Total	2021 EBITDA	2020 Sales		2020 Percent of Total	2020 EBITDA	Percent change 2021 vs. 2020 Sales	Percent change 2021 vs. 2020 EBITDA
Engine	$	9,954	42 %	$ 1,411	$	8,022	41 %	$ 1,235	24 %	14 %
Distribution		7,772	32 %	731		7,136	36 %	665	9 %	10 %
Components		7,665	32 %	1,180		6,024	31 %	961	27 %	23 %
Power Systems		4,415	18 %	496		3,631	18 %	343	22 %	45 %
New Power		116	1 %	(223)		72	— %	(172)	61 %	(30) %
Intersegment eliminations		(5,901)	(25)%	(74)		(5,074)	(26)%	76	16 %	NM
Total	$	24,021	100 %	$ 3,521	$	19,811	100 %	$ 3,108	21 %	13 %

"NM" - not meaningful information

Cost of sales, selling, general and administrative and research, development and engineering expenses increased due to higher compensation costs (primarily driven by the restoration of 2020 salary reductions, higher variable compensation and 2020 salary increases deferred until 2021), which impacted the variances in gross margin and net income as well as all of our operating segments for the year ended December 31, 2021.

Net income attributable to Cummins Inc. for 2021 was $2.1 billion, or $14.61 per diluted share, on sales of $24.0 billion, compared to 2020 net income attributable to Cummins Inc. of $1.8 billion, or $12.01 per diluted share, on sales of $19.8 billion.

The increases in net income attributable to Cummins Inc. and earnings per diluted share was driven by higher net sales, increased gross margin, higher equity, royalty and interest income from investees (primarily in China due to stronger demand for trucks and construction equipment in the first half of the year), favorable foreign currency fluctuations (principally the Chinese renminbi and Australian dollar, partially offset by the Brazilian real and British pound) and a lower effective tax rate, partially offset by higher compensation expenses and incremental costs associated with supply chain constraints. The increase in gross margin was mainly due to higher volumes and favorable pricing, partially offset by higher compensation expenses, increased freight costs and higher material costs. The 1.0 percentage point decrease in gross margin as a percentage of net sales was primarily due to higher compensation expenses and increased freight costs due to supply chain constraints, which increased at a faster rate than the increase in net sales. Diluted earnings per common share for 2021 benefited $0.34 per share from fewer weighted-average shares outstanding, primarily due to the stock repurchase program.

We generated $2.3 billion of operating cash flows in 2021, compared to $2.7 billion in 2020. See the section titled "*Cash Flows*" in the "LIQUIDITY AND CAPITAL RESOURCES" section for a discussion of items impacting cash flows.

Our debt to capital ratio (total capital defined as debt plus equity) at December 31, 2021, was 30.7 percent, compared to 31.7 percent at December 31, 2020. The decrease was primarily due to a $412 million higher equity balance driven by strong returns on pension assets. At December 31, 2021, we had $3.2 billion in cash and marketable securities on hand and access to our $3.5 billion credit facilities, if necessary, to meet currently anticipated working capital, investment and funding needs.

In 2021, we repurchased $1.4 billion or 5.7 million shares of common stock. In December 2021, the Board authorized the acquisition of up to $2.0 billion of additional common stock upon completion of the 2019 repurchase plan. See Note 15, "CUMMINS INC. SHAREHOLDERS' EQUITY" to the *Consolidated Financial Statements* for additional information.

On August 18, 2021, we entered into an amended and restated five-year revolving credit agreement, which allows us to borrow up to $2 billion of unsecured funds at any time prior to August 18, 2026. On August 18, 2021, we also entered into an amended and restated 364-day credit agreement, which allows us to borrow up to $1.5 billion of unsecured funds at any time prior to August 17, 2022. This credit agreement amended and restated the prior $1.5 billion 364-day credit facility that matured on August 18, 2021.

On August 3, 2021, we announced our exploration of strategic alternatives for our filtration business. Potential strategic alternatives to be explored include the separation of our filtration business into a stand-alone company. The execution of this exploration process is dependent upon business and market conditions, along with a number of other factors and considerations.

In July 2021, the Board authorized an increase to our quarterly dividend of 7.4 percent from $1.35 per share to $1.45 per share.

In 2021, the investment gain on our U.S. pension trust was 8.1 percent while our U.K. pension trust gain was 5.1 percent. Our global pension plans, including our unfunded and non-qualified plans, were 121 percent funded at December 31, 2021. Our U.S. defined benefit plan, which represented approximately 52 percent of the worldwide pension obligation, was 138 percent funded, and our U.K. defined benefit plan was 127 percent funded at December 31, 2021. We expect to contribute approximately $47 million in cash to our global pension plans in 2022. In addition, we expect our 2022 net periodic pension cost to approximate $33 million. See application of critical accounting estimates within MD&A and Note 10, "PENSIONS AND OTHER POSTRETIREMENT BENEFITS," to the *Consolidated Financial Statements*, for additional information concerning our pension and other postretirement benefit plans.

As of the date of this filing, our credit ratings and outlooks from the credit rating agencies remain unchanged.

RESULTS OF OPERATIONS

In millions (except per share amounts)	Years ended December 31, 2021	2020	2019	Favorable/(Unfavorable) 2021 vs. 2020 Amount	2021 vs. 2020 Percent	2020 vs. 2019 Amount	2020 vs. 2019 Percent
NET SALES	**$ 24,021**	$ 19,811	$ 23,571	$ 4,210	21 %	$ (3,760)	(16) %
Cost of sales	**18,326**	14,917	17,591	(3,409)	(23) %	2,674	15 %
GROSS MARGIN	**5,695**	4,894	5,980	801	16 %	(1,086)	(18) %
OPERATING EXPENSES AND INCOME							
Selling, general and administrative expenses	**2,374**	2,125	2,454	(249)	(12) %	329	13 %
Research, development and engineering expenses	**1,090**	906	1,001	(184)	(20) %	95	9 %
Equity, royalty and interest income from investees	**506**	452	330	54	12 %	122	37 %
Restructuring actions	**—**	—	119	—	— %	119	100 %
Other operating expense, net	**(31)**	(46)	(36)	15	33 %	(10)	(28) %
OPERATING INCOME	**2,706**	2,269	2,700	437	19 %	(431)	(16) %
Interest expense	**111**	100	109	(11)	(11) %	9	8 %
Other income, net	**156**	169	243	(13)	(8) %	(74)	(30) %
INCOME BEFORE INCOME TAXES	**2,751**	2,338	2,834	413	18 %	(496)	(18) %
Income tax expense	**587**	527	566	(60)	(11) %	39	7 %
CONSOLIDATED NET INCOME	**2,164**	1,811	2,268	353	19 %	(457)	(20) %
Less: Net income attributable to noncontrolling interests	**33**	22	8	(11)	(50) %	(14)	NM
NET INCOME ATTRIBUTABLE TO CUMMINS INC.	**$ 2,131**	$ 1,789	$ 2,260	$ 342	19 %	$ (471)	(21) %
Diluted earnings per common share attributable to Cummins Inc.	**$ 14.61**	$ 12.01	$ 14.48	$ 2.60	22 %	$ (2.47)	(17) %

"NM" - not meaningful information

Percent of sales	2021	2020	2019	Favorable/(Unfavorable) Percentage Points 2021 vs. 2020	2020 vs. 2019
Gross margin	**23.7 %**	24.7 %	25.4 %	(1.0)	(0.7)
Selling, general and administrative expenses	**9.9 %**	10.7 %	10.4 %	0.8	(0.3)
Research, development and engineering expenses	**4.5 %**	4.6 %	4.2 %	0.1	(0.4)

2021 vs. 2020

Cost of sales, selling, general and administrative and research, development and engineering expenses increased due to higher compensation costs (primarily driven by the restoration of 2020 salary reductions, higher variable compensation and 2020 salary increases deferred until 2021), which impacted the variances in gross margin and net income as well as all of our operating segments for the year ended December 31, 2021.

Net Sales

Net sales increased $4.2 billion, primarily driven by the following:

- Engine segment sales increased 24 percent principally due to higher volumes in global medium-duty truck markets and the North American heavy-duty truck and pick-up truck markets.
- Components segment sales increased 27 percent largely due to higher emission solutions demand in North America, India and Western Europe.
- Power Systems segment sales increased 22 percent primarily due to higher demand in power generation markets in China, India and North America and global mining markets.
- Distribution segment sales increased 9 percent mainly due to higher demand across all product lines in North America and improved demand in Russia, Asia Pacific, Africa and India.

- Favorable foreign currency fluctuations of 2 percent of total sales, primarily in the Chinese renminbi, Euro and Australian dollar.
- New Power segment sales increased 61 percent principally due to higher sales in North America.

Sales to international markets (excluding the U.S. and Canada), based on location of customers, were 44 percent of total net sales in 2021, compared with 42 percent of total net sales in 2020. A more detailed discussion of sales by segment is presented in the "OPERATING SEGMENT RESULTS" section.

Cost of Sales

The types of expenses included in cost of sales are the following: parts and material consumption, including direct and indirect materials; salaries, wages and benefits; depreciation on production equipment and facilities and amortization of technology intangibles; estimated costs of warranty programs and campaigns; production utilities; production-related purchasing; warehousing, including receiving and inspection; freight costs; engineering support costs; repairs and maintenance; production and warehousing facility property insurance; rent for production facilities and other production overhead.

Gross Margin

Gross margin increased $801 million and decreased 1.0 points as a percentage of sales. The increase in gross margin was mainly due to higher volumes and favorable pricing, partially offset by higher compensation expenses, increased freight costs and higher material costs. The 1.0 percentage point decrease in gross margin as a percentage of net sales was primarily due to higher compensation expenses and increased freight costs due to supply chain constraints, which increased at a faster rate than the increase in net sales. The provision for base warranties issued as a percentage of sales, was 2.1 percent in 2021 and 2.2 percent in 2020.

Selling, General and Administrative Expenses

Selling, general and administrative expenses increased $249 million, primarily due to higher compensation expenses. Overall, selling, general and administrative expenses, as a percentage of sales, decreased to 9.9 percent in 2021 from 10.7 percent in 2020. The decrease in selling, general and administrative expenses as a percentage of sales was mainly due to net sales increasing at a faster rate than the increase in selling, general and administrative expenses.

Research, Development and Engineering Expenses

Research, development and engineering expenses increased $184 million, primarily due to higher compensation expenses and increased spending on consulting. Overall, research, development and engineering expenses, as a percentage of sales, decreased to 4.5 percent in 2021 from 4.6 percent in 2020, mainly due to net sales increasing at a faster rate than the increase in research, development and engineering expenses. Research activities continue to focus on development of new products to meet future emission standards around the world, improvements in fuel economy performance of diesel and natural gas-powered engines and related components as well as development activities around fully electric, hybrid and hydrogen powertrain solutions.

Equity, Royalty and Interest Income From Investees

Equity, royalty and interest income from investees increased $54 million, primarily due to higher earnings at Dongfeng Cummins Engine Co., Ltd., Tata Cummins Ltd. (excluding the 2020 benefits noted below) and Chongqing Cummins Engine Co., Ltd., as well as the absence of $13 million of impairment charges and an $8 million loss on sale of a joint venture both recorded in 2020. These increases were partially offset by the absence of a $37 million favorable adjustment ($18 million of which related to Tata Cummins Ltd.) as the result of tax changes within India's 2020-2021 Union Budget (India Tax Law Changes) passed in March 2020 and $18 million of technology fee revenue related to Tata Cummins Ltd., both recorded in 2020. See NOTE 4, "INCOME TAXES" to the *Consolidated Financial Statements* for additional information on India Tax Law Changes.

Our joint venture agreement for Cummins Westport, Inc. expired on December 31, 2021, and will not be renewed. Beginning in January 2022, engines previously sold through the joint venture will now be included in our consolidated results.

Other Operating Expense, Net

Other operating (expense) income, net was as follows:

In millions	Years ended December 31, 2021	2020
Amortization of intangible assets	**$ (22)**	$ (22)
Loss on write-off of assets	**(12)**	(20)
Loss on sale of assets, net	**(2)**	(10)
Royalty income, net	**9**	5
Other, net	**(4)**	1
Total other operating expense, net	**$ (31)**	$ (46)

Interest Expense

Interest expense increased $11 million, primarily due to increased interest expense associated with our $2 billion senior unsecured notes issued in August of 2020, partially offset by lower commercial paper interest expense.

Other Income, Net

Other income, net was as follows:

In millions	Years ended December 31, 2021	2020
Non-service pension and OPEB credit	**$ 96**	$ 65
Interest income	**25**	21
Gain on sale of land	**18**	—
Gain on marketable securities, net	**6**	9
Foreign currency gain, net	**2**	4
Gain on corporate owned life insurance	**—**	57
Other, net	**9**	13
Total other income, net	**$ 156**	$ 169

Income Tax Expense

Our effective tax rate for 2021 was 21.3 percent compared to 22.5 percent for 2020.

The year ended December 31, 2021, contained unfavorable net discrete tax items of $9 million, primarily due to $12 million of unfavorable provision to return adjustments related to the 2020 filed tax returns, partially offset by $3 million of favorable other discrete tax items.

The year ended December 31, 2020, contained $26 million of unfavorable net discrete tax items, primarily due to $33 million of unfavorable changes in tax reserves and $10 million of withholding tax adjustments, partially offset by $15 million of favorable changes due to the India Tax Law Change. The India Tax Law Change eliminated the dividend distribution tax and replaced it with a lower rate withholding tax as the burden shifted from the dividend payor to the dividend recipient for a net favorable income statement impact of $35 million. See NOTE 4, "INCOME TAXES" to the *Consolidated Financial Statements* for additional information on India Tax Law Changes.

The change in effective tax rate for the year ended December 31, 2021, versus year ended December 31, 2020, was primarily due to a $16 million decrease in net discrete tax items.

Our effective tax rate for 2022 is expected to approximate 21.5 percent, excluding any discrete tax items that may arise.

Net Income Attributable to Noncontrolling Interests

Noncontrolling interests eliminate the income or loss attributable to non-Cummins ownership interests in our consolidated entities. Noncontrolling interests in income of consolidated subsidiaries increased $11 million principally due to higher earnings at Cummins India Limited and Eaton Cummins Joint Venture, partially offset by the absence of a $19 million unfavorable adjustment as the result of India Tax Law Changes passed in March 2020. See NOTE 4, "INCOME TAXES" to the *Consolidated Financial Statements* for additional information on India Tax Law Changes.

Net Income Attributable to Cummins Inc. and Diluted Earnings Per Common Share Attributable to Cummins Inc.

Net income and diluted earnings per share attributable to Cummins Inc. decreased $342 million and $2.60 per share, respectively, primarily due to higher net sales, increased gross margin, higher equity, royalty and interest income from investees (primarily in China due to stronger demand for trucks and construction equipment in the first half of the year), favorable foreign currency fluctuations (principally the Chinese renminbi and Australian dollar, partially offset by the Brazilian real and British pound) and a lower effective tax rate, partially offset by higher compensation expenses and incremental costs associated with supply chain constraints. Diluted earnings per common share for 2021 benefited $0.34 per share from fewer weighted-average shares outstanding, primarily due to the stock repurchase program.

2020 vs. 2019

For prior year results of operations comparisons to 2019 see the Results of Operations section of our 2020 Form 10-K.

Comprehensive Income - Foreign Currency Translation Adjustment

The foreign currency translation adjustment was a net loss of $9 million and a net gain of $71 million for the years ended December 31, 2021 and 2020, respectively. The details were as follows:

	Years ended December 31,			
	2021		2020	
In millions	Translation adjustment	Primary currency driver vs. U.S. dollar	Translation adjustment	Primary currency driver vs. U.S. dollar
Wholly-owned subsidiaries	**$ (23)**	Brazilian real, British pound, Indian rupee, Euro, partially offset by Chinese renminbi	$ 23	Chinese renminbi, partially offset by Brazilian real and British pound
Equity method investments	**19**	Chinese renminbi, partially offset by Indian rupee	58	Chinese renminbi
Consolidated subsidiaries with a noncontrolling interest	**(5)**	Indian rupee	(10)	Indian rupee
Total	**$ (9)**		$ 71	

2020 vs. 2019

For prior year foreign currency translation adjustment comparisons to 2019 see the Results of Operations section of our 2020 Form 10-K.

OPERATING SEGMENT RESULTS

Our reportable operating segments consist of the Engine, Distribution, Components, Power Systems and New Power segments. This reporting structure is organized according to the products and markets each segment serves. We use segment EBITDA as the primary basis for the Chief Operating Decision Maker to evaluate the performance of each of our reportable operating segments. We believe EBITDA is a useful measure of our operating performance as it assists investors and debt holders in comparing our performance on a consistent basis without regard to financing methods, capital structure, income taxes or depreciation and amortization methods, which can vary significantly depending upon many factors. Segment amounts exclude certain expenses not specifically identifiable to segments. See Note 22, "OPERATING SEGMENTS," to the *Consolidated Financial Statements* for additional information and a reconciliation of our segment information to the corresponding amounts in our *Consolidated Statements of Net Income*.

The outbreak of COVID-19 in early 2020 became a global pandemic with the resultant economic impacts evolving into a worldwide recession. The pandemic triggered a significant downturn in our markets globally, which negatively impacted our sales and results of operations during 2020. While the majority of the negative impacts to demand largely subsided in 2021, we are still experiencing supply chain disruptions and related financial impacts reflected as increased cost of sales. Our industry continues to be unfavorably impacted by supply chain constraints leading to shortages across multiple components categories and limiting our collective ability to meet end-user demand. Our customers are also experiencing other supply chain issues and slowing production.

Following is a discussion of results for each of our operating segments.

For all prior year segment results comparisons to 2019 see the Results of Operations section of our 2020 Form 10-K.

Engine Segment Results

Financial data for the Engine segment was as follows:

				Favorable/(Unfavorable)			
	Years ended December 31,			2021 vs. 2020		2020 vs. 2019	
In millions	**2021**	**2020**	**2019**	**Amount**	**Percent**	**Amount**	**Percent**
External sales	**$ 7,589**	$ 5,925	$ 7,570	$ 1,664	28 %	$ (1,645)	(22)%
Intersegment sales	**2,365**	2,097	2,486	268	13 %	(389)	(16)%
Total sales	**9,954**	8,022	10,056	1,932	24 %	(2,034)	(20)%
Research, development and engineering expenses	**399**	290	337	(109)	(38)%	47	14 %
Equity, royalty and interest income from investees	**340**	312	200	28	9 %	112	56 %
Interest income	**8**	9	15	(1)	(11)%	(6)	(40)%
Restructuring actions	**—**	—	18	—	— %	18	100 %
Segment EBITDA	**1,411**	1,235	1,454	176	14 %	(219)	(15)%
				Percentage Points		Percentage Points	
Segment EBITDA as a percentage of total sales	**14.2 %**	15.4 %	14.5 %	(1.2)		0.9	

Sales for our Engine segment by market were as follows:

				Favorable/(Unfavorable)			
	Years ended December 31,			2021 vs. 2020		2020 vs. 2019	
In millions	**2021**	**2020**	**2019**	**Amount**	**Percent**	**Amount**	**Percent**
Heavy-duty truck	**$ 3,328**	$ 2,648	$ 3,555	$ 680	26 %	$ (907)	(26) %
Medium-duty truck and bus	**2,777**	2,066	2,707	711	34 %	(641)	(24) %
Light-duty automotive	**1,912**	1,547	1,804	365	24 %	(257)	(14) %
Total on-highway	**8,017**	6,261	8,066	1,756	28 %	(1,805)	(22) %
Off-highway	**1,937**	1,761	1,990	176	10 %	(229)	(12) %
Total sales	**$ 9,954**	$ 8,022	$ 10,056	$ 1,932	24 %	$ (2,034)	(20) %
				Percentage Points		Percentage Points	
On-highway sales as percentage of total sales	**81 %**	78 %	80 %	3		(2)	

Unit shipments by engine classification (including unit shipments to Power Systems and off-highway engine units included in their respective classification) were as follows:

	Years ended December 31,			Favorable/(Unfavorable)			
				2021 vs. 2020		2020 vs. 2019	
	2021	2020	2019	Amount	Percent	Amount	Percent
Heavy-duty	**117,600**	92,500	122,600	25,100	27 %	(30,100)	(25) %
Medium-duty	**273,800**	220,900	283,400	52,900	24 %	(62,500)	(22) %
Light-duty	**273,300**	215,800	245,900	57,500	27 %	(30,100)	(12) %
Total unit shipments	**664,700**	529,200	651,900	135,500	26 %	(122,700)	(19) %

2021 vs. 2020

Sales

Engine segment sales increased $1,932 million across all markets. The following were the primary drivers by market:

- Medium-duty truck and bus sales increased $711 million mainly due to higher global medium-duty demand, especially in North America, Brazil and Western Europe, partially offset by lower bus sales, mainly in North America and Western Europe.
- Heavy-duty truck engine sales increased $680 million principally due to higher volumes in North America with shipments up 37 percent.
- Light-duty automotive sales increased $365 million primarily due to higher pick-up sales in North America with shipments up 27 percent.
- Off-highway sales increased $176 million mainly due to increased demand in global construction markets, especially in Asia Pacific, Europe and North America.

Segment EBITDA

Engine segment EBITDA increased $176 million, primarily due to higher volumes and higher equity, royalty and interest income from investees mainly from our Chinese joint ventures, partially offset by increased compensation expenses, higher freight costs due to supply chain constraints and increased material costs.

Distribution Segment Results

Financial data for the Distribution segment was as follows:

	Years ended December 31,			Favorable/(Unfavorable)			
				2021 vs. 2020		2020 vs. 2019	
In millions	2021	2020	2019	Amount	Percent	Amount	Percent
External sales	**$ 7,742**	$ 7,110	$ 8,040	$ 632	9 %	$ (930)	(12)%
Intersegment sales	**30**	26	31	4	15 %	(5)	(16)%
Total sales	**7,772**	7,136	8,071	636	9 %	(935)	(12)%
Research, development and engineering expenses	**48**	31	28	(17)	(55)%	(3)	(11)%
Equity, royalty and interest income from investees	**63**	62	52	1	2 %	10	19 %
Interest income	**7**	4	15	3	75 %	(11)	(73)%
Restructuring actions	**—**	—	37	—	— %	37	100 %
Segment EBITDA	**731**	665	656	66	10 %	9	1 %
				Percentage Points		Percentage Points	
Segment EBITDA as a percentage of total sales	**9.4 %**	9.3 %	8.1 %		0.1		1.2

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Sales for our Distribution segment by region were as follows:

	Years ended December 31,			Favorable/(Unfavorable)			
				2021 vs. 2020		2020 vs. 2019	
In millions	2021	2020	2019	Amount	Percent	Amount	Percent
North America	**$ 4,912**	$ 4,696	$ 5,533	$ 216	5 %	$ (837)	(15)%
Asia Pacific	**906**	805	878	101	13 %	(73)	(8)%
Europe	**650**	598	531	52	9 %	67	13 %
Russia	**335**	194	159	141	73 %	35	22 %
China	**330**	346	358	(16)	(5) %	(12)	(3)%
Africa and Middle East	**259**	200	235	59	30 %	(35)	(15)%
India	**198**	150	201	48	32 %	(51)	(25)%
Latin America	**182**	147	176	35	24 %	(29)	(16)%
Total sales	**$ 7,772**	$ 7,136	$ 8,071	$ 636	9 %	$ (935)	(12)%

Sales for our Distribution segment by product line were as follows:

	Years ended December 31,			Favorable/(Unfavorable)			
				2021 vs. 2020		2020 vs. 2019	
In millions	2021	2020	2019	Amount	Percent	Amount	Percent
Parts	**$ 3,145**	$ 2,931	$ 3,290	$ 214	7 %	$ (359)	(11)%
Power generation	**1,762**	1,692	1,784	70	4 %	(92)	(5)%
Engines	**1,499**	1,250	1,518	249	20 %	(268)	(18)%
Service	**1,366**	1,263	1,479	103	8 %	(216)	(15)%
Total sales	**$ 7,772**	$ 7,136	$ 8,071	$ 636	9 %	$ (935)	(12)%

2021 vs. 2020

Sales

Distribution segment sales increased $636 million across all product lines. The following were the primary drivers by region:

- North American sales increased $216 million, representing 34 percent of the total change in Distribution segment sales, due to higher demand in all product lines.
- Improved demand in Russia, Asia Pacific, Africa and India.
- Favorable foreign currency fluctuations, primarily in the Australian dollar, Canadian dollar and Chinese renminbi.

Segment EBITDA

Distribution segment EBITDA increased $66 million, primarily due to higher volumes and favorable foreign currency fluctuations (especially the Australian dollar), partially offset by higher compensation expenses.

Components Segment Results

Financial data for the Components segment was as follows:

	Years ended December 31,			Favorable/(Unfavorable)			
				2021 vs. 2020		2020 vs. 2019	
In millions	**2021**	**2020**	**2019**	**Amount**	**Percent**	**Amount**	**Percent**
External sales	**$ 5,932**	$ 4,650	$ 5,253	$ 1,282	28 %	$ (603)	(11)%
Intersegment sales	**1,733**	1,374	1,661	359	26 %	(287)	(17)%
Total sales	**7,665**	6,024	6,914	1,641	27 %	(890)	(13)%
Research, development and engineering expenses	**307**	264	300	(43)	(16)%	36	12 %
Equity, royalty and interest income from investees	**50**	61	40	(11)	(18)%	21	53 %
Interest income	**5**	4	8	1	25 %	(4)	(50)%
Restructuring actions	**—**	—	20	—	— %	20	100 %
Segment EBITDA	**1,180**	961	1,097	219	23 %	(136)	(12)%
				Percentage Points		Percentage Points	
Segment EBITDA as a percentage of total sales	**15.4 %**	16.0 %	15.9 %		(0.6)		0.1

Sales for our Components segment by business were as follows:

	Years ended December 31,			Favorable/(Unfavorable)			
				2021 vs. 2020		2020 vs. 2019	
In millions	**2021**	**2020**	**2019**	**Amount**	**Percent**	**Amount**	**Percent**
Emission solutions	**$ 3,499**	$ 2,632	$ 3,122	$ 867	33 %	$ (490)	(16)%
Filtration	**1,438**	1,232	1,281	206	17 %	(49)	(4)%
Turbo technologies	**1,351**	1,098	1,218	253	23 %	(120)	(10)%
Electronics and fuel systems	**899**	754	759	145	19 %	(5)	(1)%
Automated transmissions	**478**	308	534	170	55 %	(226)	(42)%
Total sales	**$ 7,665**	$ 6,024	$ 6,914	$ 1,641	27 %	$ (890)	(13)%

2021 vs. 2020

Sales

Components segment sales increased $1,641 million across all businesses. The following were the primary drivers by business:

- Emission solutions sales increased $867 million primarily due to stronger demand in North America, India and Western Europe.
- Turbo technologies sales increased $253 million principally due to higher demand in North America and Western Europe.
- Filtration sales increased $206 million mainly due to stronger demand in North America, Europe, Latin America and Asia Pacific.
- Automated transmission sales increased $170 million principally due to higher demand in North America and expanded product offering in China.
- Favorable foreign currency fluctuations primarily in the Chinese renminbi and Euro.

Segment EBITDA

Components segment EBITDA increased $219 million, mainly due to higher volumes and favorable mix, partially offset by higher compensation expenses, increased material costs and higher freight costs due to supply chain constraints.

Power Systems Segment Results

Financial data for the Power Systems segment was as follows:

	Years ended December 31,			Favorable/(Unfavorable) 2021 vs. 2020		Favorable/(Unfavorable) 2020 vs. 2019	
In millions	**2021**	**2020**	**2019**	**Amount**	**Percent**	**Amount**	**Percent**
External sales	**$ 2,650**	$ 2,055	$ 2,670	$ 595	29 %	$ (615)	(23)%
Intersegment sales	**1,765**	1,576	1,790	189	12 %	(214)	(12)%
Total sales	**4,415**	3,631	4,460	784	22 %	(829)	(19)%
Research, development and engineering expenses	**234**	212	230	(22)	(10) %	18	8 %
Equity, royalty and interest income from investees	**56**	21	38	35	NM	(17)	(45)%
Interest income	**5**	4	8	1	25 %	(4)	(50)%
Restructuring actions	**—**	—	12	—	— %	12	100 %
Segment EBITDA	**496**	343	512	153	45 %	(169)	(33)%
				Percentage Points		**Percentage Points**	
Segment EBITDA as a percentage of total sales	**11.2 %**	9.4 %	11.5 %	1.8		(2.1)	

"NM" - not meaningful information

Sales for our Power Systems segment by product line were as follows:

	Years ended December 31,			Favorable/(Unfavorable) 2021 vs. 2020		Favorable/(Unfavorable) 2020 vs. 2019	
In millions	**2021**	**2020**	**2019**	**Amount**	**Percent**	**Amount**	**Percent**
Power generation	**$ 2,515**	$ 2,167	$ 2,518	$ 348	16 %	$ (351)	(14) %
Industrial	**1,534**	1,188	1,576	346	29 %	(388)	(25) %
Generator technologies	**366**	276	366	90	33 %	(90)	(25) %
Total sales	**$ 4,415**	$ 3,631	$ 4,460	$ 784	22 %	$ (829)	(19) %

2021 vs. 2020

Sales

Power Systems segment sales increased $784 million across all product lines. The following were the primary drivers:

- Power generation sales increased $348 million due to higher demand in China, India and North America.
- Industrial sales increased $346 million due to higher demand in global mining markets.
- Favorable foreign currency fluctuations primarily in the Chinese renminbi and British pound.

Segment EBITDA

Power Systems segment EBITDA increased $153 million, primarily due to higher volumes and increased earnings in equity, royalty and interest income from investees, partially offset by higher compensation expenses, increased freight costs due to supply chain constraints and higher material costs.

New Power Segment Results

The New Power segment designs, manufactures, sells and supports hydrogen production solutions as well as electrified power systems ranging from fully electric to hybrid along with innovative components and subsystems, including battery and fuel cell technologies. The New Power segment is currently in the development phase with a primary focus on research and development activities for our power systems, components and subsystems. Financial data for the New Power segment was as follows:

In millions	Years ended December 31, 2021	2020	2019	Favorable/(Unfavorable) 2021 vs. 2020 Amount	Percent	Favorable/(Unfavorable) 2020 vs. 2019 Amount	Percent
External sales	**$ 108**	$ 71	$ 38	$ 37	52 %	$ 33	87 %
Intersegment sales	**8**	1	—	7	NM	1	NM
Total sales	**116**	72	38	44	61 %	34	89 %
Research, development and engineering expenses	**102**	109	106	7	6 %	(3)	(3) %
Equity, royalty and interest loss from investees	**(3)**	(4)	—	1	25 %	(4)	NM
Restructuring actions	**—**	—	1	—	— %	1	100 %
Segment EBITDA	**(223)**	(172)	(149)	(51)	(30) %	(23)	(15) %

"NM" - not meaningful information

New Power segment sales increased 61 percent principally due to increased sales in North America.

2022 OUTLOOK

COVID-19 Impacts

The outbreak of COVID-19 in early 2020 became a global pandemic with the resultant economic impacts evolving into a worldwide recession. The pandemic triggered a significant downturn in our markets globally, which negatively impacted our sales and results of operations during 2020. While the majority of the negative impacts to demand largely subsided in 2021, we are still experiencing supply chain disruptions and related financial impacts reflected as increased cost of sales. Our industry continues to be unfavorably impacted by supply chain constraints leading to shortages across multiple components categories and limiting our collective ability to meet end-user demand. Our customers are also experiencing other supply chain issues and slowing production. Should the supply chain issues continue for an extended period of time or worsen, the impact on our production and supply chain could have a material adverse effect on our results of operations, financial condition and cash flows. Our Board of Directors (the Board) continues to monitor and evaluate all of these factors and the related impacts on our business and operations, and we are diligently working to minimize the supply chain impacts to our business and to our customers.

Business Outlook

Our outlook reflects the following positive trends and challenges to our business that could impact our revenue and earnings potential in 2022.

Positive Trends

- We expect demand for pick-up trucks in North America to remain strong.
- We estimate North American medium-duty and heavy-duty truck demand will continue to improve.
- We believe market demand for trucks in India will continue the improvement trend from the second half of 2021.
- We anticipate our aftermarket business will continue to improve, driven primarily by increased truck utilization in North America.
- Our liquidity of $6.4 billion in cash, marketable securities and available credit facilities puts us in a strong position to deal with any uncertainties that may arise in 2022.

Challenges

- Supply constraints driven by strong demand in multiple end markets and regions may lead to increased costs, including higher freight and conversion costs.
- Continued increases in material and commodity costs could negatively impact earnings.
- Our industry's sales continue to be unfavorably impacted by supply chain constraints leading to shortages across multiple components categories and limiting our collective ability to meet end-user demand. Our customers are also experiencing other supply chain issues slowing production.
- We expect market demand in truck and construction markets in China to decline from 2021 full year levels.

Separation of Filtration Business

On August 3, 2021, we announced our exploration of strategic alternatives for our filtration business. Potential strategic alternatives to be explored include the separation of our filtration business into a stand-alone company. The execution of this exploration process is dependent upon business and market conditions, along with a number of other factors and considerations.

LIQUIDITY AND CAPITAL RESOURCES

Key Working Capital and Balance Sheet Data

We fund our working capital with cash from operations and short-term borrowings, including commercial paper, when necessary. Various assets and liabilities, including short-term debt, can fluctuate significantly from month to month depending on short-term liquidity needs. As a result, working capital is a prime focus of management's attention. Working capital and balance sheet measures are provided in the following table:

Dollars in millions	December 31, 2021	December 31, 2020
Working capital [(1)]	**$ 5,225**	$ 5,562
Current ratio	**1.74**	1.88
Accounts and notes receivable, net	**$ 3,990**	$ 3,820
Days' sales in receivables	**59**	69
Inventories	**$ 4,355**	$ 3,425
Inventory turnover	**4.6**	4.2
Accounts payable (principally trade)	**$ 3,021**	$ 2,820
Days' payable outstanding	**57**	68
Total debt	**$ 4,159**	$ 4,164
Total debt as a percent of total capital	**30.7 %**	31.7 %

[(1)] Working capital includes cash and cash equivalents.

Cash Flows

Cash and cash equivalents were impacted as follows:

	Years ended December 31,			Change	
In millions	2021	2020	2019	2021 vs. 2020	2020 vs. 2019
Net cash provided by operating activities	**$ 2,256**	$ 2,722	$ 3,181	$ (466)	$ (459)
Net cash used in investing activities	**(873)**	(719)	(1,150)	(154)	431
Net cash (used in) provided by financing activities	**(2,227)**	280	(2,095)	(2,507)	2,375
Effect of exchange rate changes on cash and cash equivalents	**35**	(11)	(110)	46	99
Net (decrease) increase in cash and cash equivalents	**$ (809)**	$ 2,272	$ (174)	$ (3,081)	$ 2,446

2021 vs. 2020

Net cash provided by operating activities decreased $466 million, primarily due to higher working capital requirements of $724 million and a net decrease in changes in other liabilities of $195 million, partially offset by higher consolidated net income of $353 million and lower restructuring payments of $109 million. During 2021, higher working capital requirements resulted in a cash outflow of $359 million compared to a cash inflow of $365 million in 2020, mainly due to higher inventories, partially offset by higher accrued expenses.

Net cash used in investing activities increased $154 million, principally due to higher capital expenditures of $206 million, partially offset by favorable changes in cash flows from derivatives not designated as hedges of $45 million and increased proceeds from sale of land of $20 million.

Net cash used in financing activities increased $2,507 million, primarily due to lower proceeds from borrowings of $1,935 million, mainly resulting from our $2 billion bond issuance in 2020, and higher repurchases of common stock of $761 million, partially offset by lower net payments of commercial paper of $327 million.

The effect of exchange rate changes on cash and cash equivalents increased $46 million, primarily due to favorable fluctuations in the British pound of $55 million, partially offset by unfavorable fluctuations in the South Korean won, Chinese renminbi and Australian dollar.

2020 vs. 2019

For prior year liquidity comparisons see the Liquidity and Capital Resources section of our 2020 Form 10-K.

Sources of Liquidity

We generate significant ongoing cash flow. Cash provided by operations is our principal source of liquidity with $2.3 billion provided in 2021. At December 31, 2021, our sources of liquidity included:

	December 31, 2021			
In millions	**Total**	**U.S.**	**International**	**Primary location of international balances**
Cash and cash equivalents	$ 2,592	$ 509	$ 2,083	China, Singapore, Netherlands, Belgium, Australia, Mexico, Canada
Marketable securities [1]	595	106	489	India
Total	$ 3,187	$ 615	$ 2,572	
Available credit capacity				
Revolving credit facilities [2]	$ 3,187			
International and other uncommitted domestic credit facilities	$ 234			

[1] The majority of marketable securities could be liquidated into cash within a few days.

[2] The five-year credit facility for $2.0 billion and the 364-day credit facility for $1.5 billion, maturing August 2026 and August 2022, respectively, are maintained primarily to provide backup liquidity for our commercial paper borrowings and general corporate purposes. At December 31, 2021, we had $313 million of commercial paper outstanding, which effectively reduced the available capacity under our revolving credit facilities to $3.2 billion.

Cash, Cash Equivalents and Marketable Securities

A significant portion of our cash flows are generated outside the U.S. We manage our worldwide cash requirements considering available funds among the many subsidiaries through which we conduct our business and the cost effectiveness with which those funds can be accessed. As a result, we do not anticipate any local liquidity restrictions to preclude us from funding our operating needs with local resources.

If we distribute our foreign cash balances to the U.S. or to other foreign subsidiaries, we could be required to accrue and pay withholding taxes, for example, if we repatriated cash from certain foreign subsidiaries whose earnings we asserted are completely or partially permanently reinvested. Foreign earnings for which we assert permanent reinvestment outside the U.S. consist primarily of earnings of our China, India and Netherlands domiciled subsidiaries. At present, we do not foresee a need to repatriate any earnings for which we asserted permanent reinvestment. However, to help fund cash needs of the U.S. or other international subsidiaries as they arise, we repatriate available cash from certain foreign subsidiaries whose earnings are not permanently reinvested when it is cost effective to do so.

Debt Facilities and Other Sources of Liquidity

On August 18, 2021, we entered into an amended and restated five-year revolving credit agreement, which allows us to borrow up to $2 billion of unsecured funds at any time prior to August 18, 2026. On August 18, 2021, we also entered into an amended and restated 364-day credit agreement, which allows us to borrow up to $1.5 billion of unsecured funds at any time prior to August 17, 2022. This credit agreement amended and restated the prior $1.5 billion 364-day credit facility that matured on August 18, 2021. See Note 12, "DEBT," to our *Consolidated Financial Statements* for additional information.

We have access to committed credit facilities that total $3.5 billion, including the $1.5 billion 364-day facility that expires August 17, 2022 and our $2.0 billion five-year facility that expires on August 18, 2026. We intend to maintain credit facilities at the current or higher aggregate amounts by renewing or replacing these facilities at or before expiration. These revolving credit facilities are maintained primarily to provide backup liquidity for our commercial paper borrowings and for general corporate purposes. Both credit agreements include various financial covenants, including, among others, maintaining a net debt to capital ratio of no more than 0.65 to 1.0. At December 31, 2021, our leverage ratio was 0.12 to 1.0. There were no outstanding borrowings under these facilities at December 31, 2021.

We can issue up to $3.5 billion of unsecured, short-term promissory notes (commercial paper) pursuant to the Board authorized commercial paper programs. The programs facilitate the private placement of unsecured short-term debt through third-party brokers. We intend to use the net proceeds from the commercial paper borrowings for general corporate purposes. The total combined borrowing capacity under the revolving credit facilities and commercial paper programs should not exceed $3.5 billion. See Note 12, "DEBT," to our *Consolidated Financial Statements* for additional information.

At December 31, 2021, we had $313 million of commercial paper outstanding, which effectively reduced the available capacity under our revolving credit facilities to $3.2 billion.

In the second half of 2021, we entered into a series of interest rate swaps to effectively convert our $500 million senior notes, due in 2025, from a fixed rate of 0.75 percent to a floating rate equal to the three-month LIBOR plus a spread. We also entered into a series of interest rate swaps to effectively convert $765 million of our $850 million senior notes, due in 2030, from a fixed rate of 1.50 percent to a floating rate equal to the three-month LIBOR plus a spread. The swaps were designated, and will be accounted for, as fair value hedges.

As a well-known seasoned issuer, we filed an automatic shelf registration for an undetermined amount of debt and equity securities with the SEC on February 13, 2019. Under this shelf registration we may offer, from time to time, debt securities, common stock, preferred and preference stock, depositary shares, warrants, stock purchase contracts and stock purchase units. We plan to file a new shelf registration statement in the first quarter of 2022, prior to the expiration of the shelf registration statement currently in effect.

In July 2017, the U.K.'s Financial Conduct Authority, which regulates the London Interbank Offered Rate (LIBOR), announced it intends to phase out LIBOR by the end of 2021. The cessation date for submission and publication of rates for certain tenors of LIBOR has since been extended until mid-2023. Various central bank committees and working groups continue to discuss replacement of benchmark rates, the process for amending existing LIBOR-based contracts and the potential economic impacts of different alternatives. The Alternative Reference Rates Committee has identified the Secured Overnight Financing Rate (SOFR) as its preferred alternative rate for U.S. dollar LIBOR. SOFR is a measure of the cost of borrowing cash overnight, collateralized by U.S. Treasury securities, and is based on directly observable U.S. Treasury-backed repurchase transactions. We have evaluated the potential impact of the replacement of the LIBOR benchmark interest rate including risk management, internal operational readiness and monitoring the Financial Accounting Standards Board standard-setting process to address financial reporting issues that might arise in connection with transition from LIBOR to a new benchmark rate. While we do not believe the change will materially impact us due to our operational and system readiness coupled with relevant contractual fallback language, we continue to evaluate all eventual transition risks. In anticipation of LIBOR's phase out, our most recent revolving credit agreements include a well-documented transition mechanism for selecting a benchmark replacement rate for LIBOR, subject to our agreement. Additionally, with respect to our $1.3 billion in LIBOR-based fixed to variable rate swaps maturing in 2025 and 2030, we reviewed and believe our adherence to the 2020 LIBOR fallback protocol will allow for a smooth transition to the designated replacement rate when that transition occurs.

Supply Chain Financing

We currently have supply chain financing programs with financial intermediaries, which provide certain vendors the option to be paid by financial intermediaries earlier than the due date on the applicable invoice. When a vendor utilizes the program and receives an early payment from a financial intermediary, they take a discount on the invoice. We then pay the financial intermediary the face amount of the invoice on the regularly scheduled due date. The maximum amount that we may have outstanding under the program is $361 million. We do not reimburse vendors for any costs they incur for participation in the program and their participation is completely voluntary. As a result, all amounts owed to the financial intermediaries are presented as "Accounts payable" in our *Consolidated Balance Sheets.* Amounts due to the financial intermediaries reflected in accounts payable at December 31, 2021, were $147 million.

Uses of Cash

Stock Repurchases

In December 2021, the Board authorized the acquisition of up to $2.0 billion of additional common stock upon completion of the 2019 repurchase plan. In December 2019, the Board authorized the acquisition of up to $2.0 billion of additional common stock upon completion of the 2018 repurchase plan. For the year ended December 31, 2021, we made the following purchases under our stock repurchase program:

In millions (except per share amounts) For each quarter ended	Shares Purchased	Average Cost Per Share	Total Cost of Repurchases	Remaining Authorized Capacity [(1)]
April 4	1.7	$ 247.35	$ 418	$ 1,576
July 4	2.7	252.66	672	904
October 3	0.6	231.57	138	766
December 31	0.7	222.14	174	2,592
Total	5.7	244.73	$ 1,402	

(1) The remaining $592 million authorized capacity under the 2019 plan was calculated based on the cost to purchase the shares, but excludes commission expenses in accordance with the authorized plan.

We intend to repurchase outstanding shares from time to time during 2022 to enhance shareholder value.

Dividends

Total dividends paid to common shareholders in 2021, 2020 and 2019 were $809 million, $782 million and $761 million, respectively. Declaration and payment of dividends in the future depends upon our income and liquidity position, among other factors, and is subject to declaration by the Board, who meets quarterly to consider our dividend payment. We expect to fund dividend payments with cash from operations.

In July 2021, the Board authorized an increase to our quarterly dividend of 7.4 percent from $1.35 per share to $1.45 per share. Cash dividends per share paid to common shareholders and the Board authorized increases for the last three years were as follows:

	Quarterly Dividends		
	2021	**2020**	**2019**
First quarter	**$ 1.35**	$ 1.311	$ 1.14
Second quarter	**1.35**	1.311	1.14
Third quarter	**1.45**	1.311	1.311
Fourth quarter	**1.45**	1.35	1.311
Total	**$ 5.60**	$ 5.28	$ 4.90

Capital Expenditures

Capital expenditures, including spending on internal use software, were $786 million, $575 million and $775 million in 2021, 2020 and 2019, respectively. We continue to invest in new product lines and targeted capacity expansions. We plan to spend an estimated $850 million to $900 million in 2022 on capital expenditures, excluding internal use software, with over 60 percent of these expenditures expected to be invested in North America. In addition, we plan to spend an estimated $70 million to $80 million on internal use software in 2022.

Current Maturities of Short and Long-Term Debt

We had $313 million of commercial paper outstanding at December 31, 2021, that matures in less than one year. The maturity schedule of our existing long-term debt does not require significant cash outflows until 2023 when our 3.65 percent senior notes and 2025 when our 0.75 percent senior notes are due. Required annual long-term debt principal payments range from $24 million to $536 million over the next five years. See Note 12, "DEBT," to the *Consolidated Financial Statements* for additional information.

Pensions

Our global pension plans, including our unfunded and non-qualified plans, were 121 percent funded at December 31, 2021. Our U.S. defined benefit plan, which represented approximately 52 percent of the worldwide pension obligation, was 138 percent funded, and our U.K. defined benefit plan was 127 percent funded at December 31, 2021. The funded status of our pension plans is dependent upon a variety of variables and assumptions including return on invested assets, market interest rates and levels of voluntary contributions to the plans. In 2021, the investment gain on our U.S. pension trust was 8.1 percent while our U.K. pension trust gain was 5.1 percent. Approximately 69 percent of our pension plan assets are held in highly liquid investments such as fixed income and equity securities. The remaining 31 percent of our plan assets are held in less liquid, but market valued investments, including real estate, private equity, venture capital, opportunistic credit and insurance contracts.

We sponsor funded and unfunded domestic and foreign defined benefit pension plans. Contributions to the U.S. and U.K. plans were as follows:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
Defined benefit pension contributions	**$ 78**	$ 92	$ 121
Defined contribution pension plans	**92**	85	102

We anticipate making total contributions of approximately $47 million to our global defined benefit pension plans in 2022. Expected contributions to our defined benefit pension plans in 2022 will meet or exceed the current funding requirements.

Future Uses of Cash

A summary of our contractual obligations and other commercial commitments at December 31, 2021, are as follows:

Contractual Cash Obligations	**Payments Due by Period**	
In millions	**Current**	**Long-Term**
Long-term debt and finance lease obligations [1]	$ 172	$ 5,463
Operating leases [1]	138	348
Capital expenditures	264	—
Purchase commitments for inventory	1,037	2
Other purchase commitments	383	59
Transitional tax liability	34	255
Other postretirement benefits	19	134
International and other domestic letters of credit	77	46
Performance and excise bonds	29	74
Guarantees, indemnifications and other commitments	25	14
Total	$ 2,178	$ 6,395

(1) Includes principal payments and expected interest payments based on the terms of the obligations.

The contractual obligations reported above exclude our unrecognized tax benefits of $89 million as of December 31, 2021. We are not able to reasonably estimate the period in which cash outflows relating to uncertain tax contingencies could occur. See Note 4, "INCOME TAXES," to the *Consolidated Financial Statements* for additional information.

Credit Ratings

Our rating and outlook from each of the credit rating agencies as of the date of filing are shown in the table below:

	Long-Term	**Short-Term**	
Credit Rating Agency [1]	**Senior Debt Rating**	**Debt Rating**	**Outlook**
Standard & Poor’s Rating Services	A+	A1	Stable
Moody’s Investors Service, Inc.	A2	P1	Stable

(1) Credit ratings are not recommendations to buy, are subject to change, and each rating should be evaluated independently of any other rating. In addition, we undertake no obligation to update disclosures concerning our credit ratings, whether as a result of new information, future events or otherwise.

Management's Assessment of Liquidity

Our financial condition and liquidity remain strong. Our solid balance sheet and credit ratings enable us to have ready access to credit and the capital markets. We assess our liquidity in terms of our ability to generate adequate cash to fund our operating, investing and financing activities. We believe our existing cash and marketable securities, operating cash flow and revolving credit facilities provide us with the financial flexibility needed to fund common stock repurchases, dividend payments, targeted capital expenditures, projected pension obligations, acquisitions, working capital and debt service obligations through 2022 and beyond. We continue to generate significant cash from operations and maintain access to our revolving credit facilities and commercial paper programs as noted above.

APPLICATION OF CRITICAL ACCOUNTING ESTIMATES

A summary of our significant accounting policies is included in Note 1, "SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES," of our *Consolidated Financial Statements* which discusses accounting policies that we selected from acceptable alternatives.

Our *Consolidated Financial Statements* are prepared in accordance with generally accepted accounting principles in the U.S. which often requires management to make judgments, estimates and assumptions regarding uncertainties that affect the reported amounts presented and disclosed in the financial statements. Management reviews these estimates and assumptions based on historical experience, changes in business conditions and other relevant factors they believe to be reasonable under the circumstances. In any given reporting period, our actual results may differ from the estimates and assumptions used in preparing our *Consolidated Financial Statements.*

Critical accounting estimates are defined as follows: the estimate requires management to make assumptions about matters that were highly uncertain at the time the estimate was made; different estimates reasonably could have been used; or if changes in the estimate are reasonably likely to occur from period to period and the change would have a material impact on our financial condition or results of operations. Our senior management has discussed the development and selection of our accounting policies, related accounting estimates and the disclosures set forth below with the Audit Committee of the Board. We believe our critical accounting estimates include estimating liabilities for warranty programs, assessing goodwill impairments, accounting for income taxes and pension benefits.

Warranty Programs

We estimate and record a liability for base warranty programs at the time our products are sold. Our estimates are based on historical experience and reflect management's best estimates of expected costs at the time products are sold and subsequent adjustment to those expected costs when actual costs differ. As a result of the uncertainty surrounding the nature and frequency of product recall programs, the liability for such programs is recorded when we commit to a recall action or when a recall becomes probable and estimable, which generally occurs when management internally approves or commits to the action. Our warranty liability is generally affected by component failure rates, repair costs and the point of failure within the product life cycle. Future events and circumstances related to these factors could materially change our estimates and require adjustments to our liability. New product launches require a greater use of judgment in developing estimates until historical experience becomes available. Product specific experience is typically available four or five quarters after product launch, with a clear experience trend evident eight quarters after launch. We generally record warranty expense for new products upon shipment using a preceding product's warranty history and a multiplicative factor based upon preceding similar product experience and new product assessment until sufficient new product data is available for warranty estimation. We then use a blend of actual new product experience and preceding product historical experience for several subsequent quarters and new product specific experience thereafter. Note 13, "PRODUCT WARRANTY LIABILITY," to our *Consolidated Financial Statements* contains a summary of the activity in our warranty liability account for 2021, 2020 and 2019 including adjustments to pre-existing warranties.

Goodwill Impairment

We are required to make certain subjective and complex judgments in assessing whether a goodwill impairment event has occurred, including assumptions and estimates used to determine the fair value of our reporting units. We test for goodwill impairment at the reporting unit level and our reporting units are the operating segments or the components of operating segments that constitute businesses for which discrete financial information is available and is regularly reviewed by management.

We have the option to first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value as a basis for determining whether it is necessary to perform an annual quantitative goodwill impairment test. We elected this option on certain reporting units. The following events and circumstances are considered when evaluating whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount:

- Macroeconomic conditions, such as a deterioration in general economic conditions, fluctuations in foreign exchange rates and/or other developments in equity and credit markets;
- Industry and market considerations, such as a deterioration in the environment in which an entity operates, material loss in market share and significant declines in product pricing;
- Cost factors, such as an increase in raw materials, labor or other costs;
- Overall financial performance, such as negative or declining cash flows or a decline in actual or forecasted revenue;
- Other relevant entity-specific events, such as material changes in management or key personnel and
- Events affecting a reporting unit, such as a change in the composition or carrying amount of its net assets including acquisitions and dispositions.

The examples noted above are not all-inclusive, and we consider other relevant events and circumstances that affect the fair value of a reporting unit in determining whether to perform the quantitative goodwill impairment test.

Our goodwill recoverability assessment is based on our annual strategic planning process. This process includes an extensive review of expectations for the long-term growth of our businesses and forecasted future cash flows. In order to determine the valuation of our reporting units, we use either the market approach or the income approach using a discounted cash flow model. Our income approach method uses a discounted cash flow model in which cash flows anticipated over several periods, plus a terminal value at the end of that time horizon, are discounted to their present value using an appropriate rate of return. Our estimates are based upon our historical experience, our current knowledge from our commercial relationships and available external information about future trends.

The discounted cash flow model requires us to make projections of revenue, gross margin, operating expenses, working capital investment and fixed asset additions for the reporting units over a multi-year period. Additionally, management must estimate a weighted-average cost of capital, which reflects a market rate, for each reporting unit for use as a discount rate. The discounted cash flows are compared to the carrying value of the reporting unit and, if less than the carrying value, the difference is recorded as a goodwill impairment loss. In addition, we also perform a sensitivity analysis to determine how much our forecasts can fluctuate before the fair value of a reporting unit would be lower than its carrying amount. We perform the required procedures as of the end of our fiscal third quarter.

Accounting for Income Taxes

We determine our income tax expense using the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the future tax effects of temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis. Future tax benefits of net operating loss and credit carryforwards are also recognized as deferred tax assets. We evaluate the recoverability of our deferred tax assets each quarter by assessing the likelihood of future profitability and available tax planning strategies that could be implemented to realize our net deferred tax assets. At December 31, 2021, we recorded net deferred tax assets of $25 million. The assets included $395 million for the value of net operating loss and credit carryforwards. A valuation allowance of $360 million was recorded to reduce the tax assets to the net value management believed was more likely than not to be realized. In the event our operating performance deteriorates, future assessments could conclude that a larger valuation allowance will be needed to further reduce the deferred tax assets.

In addition, we operate within multiple taxing jurisdictions and are subject to tax audits in these jurisdictions. These audits can involve complex issues, which may require an extended period of time to resolve. We accrue for the estimated additional tax and interest that may result from tax authorities disputing uncertain tax positions. We believe we made adequate provisions for income taxes for all years that are subject to audit based upon the latest information available. A more complete description of our income taxes and the future benefits of our net operating loss and credit carryforwards is disclosed in Note 4, "INCOME TAXES," to our *Consolidated Financial Statements.*

Pension Benefits

We sponsor a number of pension plans globally, with the majority of assets in the U.S. and the U.K. In the U.S. and the U.K., we have major defined benefit plans that are separately funded. We account for our pension programs in accordance with employers' accounting for defined benefit pension plans, which requires that amounts recognized in financial statements be determined using an actuarial basis. As a result, our pension benefit programs are based on a number of statistical and judgmental assumptions that attempt to anticipate future events and are used in calculating the expense and liability related to our plans each year at December 31. These assumptions include discount rates used to value liabilities, assumed rates of return on plan assets, future compensation increases, employee turnover rates, actuarial assumptions relating to retirement age, mortality rates and participant withdrawals. The actuarial assumptions we use may differ significantly from actual results due to changing economic conditions, participant life span and withdrawal rates. These differences may result in a material impact to the amount of net periodic pension cost to be recorded in our *Consolidated Financial Statements* in the future.

The expected long-term return on plan assets is used in calculating the net periodic pension cost. We considered several factors in developing our expected rate of return on plan assets. The long-term rate of return considers historical returns and expected returns on current and projected asset allocations. Projected returns are based primarily on broad, publicly traded passive fixed income and equity indices and forward-looking estimates of the value added by active investment management. At December 31, 2021, based upon our target asset allocations, it is anticipated that our U.S. investment policy will generate an average annual return over the 30-year projection period equal to or in excess of 6.25 percent, including the additional positive returns expected from active investment management.

The one-year return for our U.S. plans was 8.1 percent for 2021. Our U.S. plan assets averaged annualized returns of 8.61 percent over the prior ten years and resulted in approximately $431 million of actuarial gains in accumulated other comprehensive loss (AOCL) in the same period. Based on the historical returns and forward-looking return expectations for capital markets, as plan assets continue to be de-risked, consistent with our investment policy, we believe our investment return assumption of 6.25 percent in 2022 for U.S. pension assets is reasonable and attainable.

The methodology used to determine the rate of return on pension plan assets in the U.K. was based on establishing an equity-risk premium over current long-term bond yields adjusted based on target asset allocations. At December 31, 2021, based upon our target asset allocations, it is anticipated that our U.K. investment policy will generate an average annual return over the 20-year projection period equal to or in excess of 4 percent. The one-year return for our U.K. plans was 5.1 percent for 2021. We generated average annualized returns of 9.14 percent over ten years, resulting in approximately $767 million of actuarial gains in AOCL. Our strategy with respect to our investments in pension plan assets is to be invested with a long-term outlook. Based on the historical returns and forward-looking return expectations as the plan assets continue to be de-risked, we believe that an investment return assumption of

3.75 percent in 2022 for U.K. pension assets is reasonable and attainable. Our target allocation for 2022 and pension plan asset allocations at December 31, 2021 and 2020 are as follows:

	U.S. Plans			U.K. Plans		
	Target Allocation	Percentage of Plan Assets at December 31,		Target Allocation	Percentage of Plan Assets at December 31,	
Investment description	2022	2021	2020	2022	2021	2020
Liability matching	**72.0 %**	**70.0 %**	66.0 %	**57.0 %**	**52.0 %**	57.0 %
Risk seeking	**28.0 %**	**30.0 %**	34.0 %	**43.0 %**	**48.0 %**	43.0 %
Total	**100.0 %**	**100.0 %**	100.0 %	**100.0 %**	**100.0 %**	100.0 %

The differences between the actual return on plan assets and expected long-term return on plan assets are recognized in the asset value used to calculate net periodic cost over five years. The table below sets forth our expected rate of return for 2022 and the expected return assumptions used to develop our pension cost for the period 2019-2021.

	Long-term Expected Return Assumptions			
	2022	2021	2020	2019
U.S. plans	**6.25 %**	**6.25 %**	6.25 %	6.25 %
U.K. plans	**3.75 %**	**4.00 %**	4.00 %	4.00 %

Pension accounting offers various acceptable alternatives to account for the differences that eventually arise between the estimates used in the actuarial valuations and the actual results. It is acceptable to delay or immediately recognize these differences. Under the delayed recognition alternative, changes in pension obligations (including those resulting from plan amendments) and changes in the value of assets set aside to meet those obligations are not recognized in net periodic pension cost as they occur but are recognized initially in AOCL and subsequently amortized as components of net periodic pension cost systematically and gradually over future periods. In addition to this approach, we may also adopt immediate recognition of actuarial gains or losses. Immediate recognition introduces volatility in financial results. We have chosen to delay recognition and amortize actuarial differences over future periods. If we adopted the immediate recognition approach, we would record a loss of $545 million ($418 million after-tax) from cumulative actuarial net losses for our U.S. and U.K. pension plans.

The difference between the expected return and the actual return on plan assets is deferred from recognition in our results of operations and under certain circumstances, such as when the difference exceeds 10 percent of the greater of the market value of plan assets or the projected benefit obligation, the difference is amortized over future years of service. This is also true of changes to actuarial assumptions. Under the delayed recognition alternative, the actuarial gains and losses are recognized and recorded in AOCL. As our losses related to the U.S. and U.K. pension plans exceed 10 percent of their respective plan assets, the excess is amortized over the average remaining service lives of participating employees. Net actuarial gains increased our shareholders' equity by $280 million after-tax in 2021. The gain is primarily due to strong asset returns and higher discount rates in the U.S. and U.K.

The table below sets forth the net periodic pension cost for the years ended December 31 and our expected cost for 2022.

In millions	2022	2021	2020	2019
Net periodic pension cost	**$ 33**	**$ 78**	$ 102	$ 65

We expect 2022 net periodic pension cost to decrease compared to 2021, primarily due to higher discount rates in the U.S. and U.K., and favorable actuarial experience in the U.S., partially offset by a lower expected rate of return in the U.K. The decrease in net periodic pension cost in 2021 compared to 2020 was primarily due to favorable actuarial experience and investment returns, partially offset by lower discount rates in the U.S. and U.K. The increase in net periodic pension cost in 2020 compared to 2019 was due to lower discount rates in the U.S. and U.K.

The weighted-average discount rates used to develop our net periodic pension cost are set forth in the table below.

	Discount Rates			
	2022	2021	2020	2019
U.S. plans	**3.01 %**	**2.62 %**	3.36 %	4.36 %
U.K. plans	**1.95 %**	**1.50 %**	2.00 %	2.80 %

The discount rate enables us to state expected future cash payments for benefits as a present value on the measurement date. The guidelines for setting this rate suggest the use of a high-quality corporate bond rate. We used bond information provided by Moody's Investor Services, Inc. and Standard & Poor's Rating Services. All bonds used to develop our hypothetical portfolio in the U.S. and U.K. were deemed high-quality, non-callable bonds (Aa or better) at December 31, 2021, by at least one of the bond rating agencies.

Our model called for projected payments until near extinction for the U.S. and the U.K. For both countries, our model matches the present value of the plan's projected benefit payments to the market value of the theoretical settlement bond portfolio. A single equivalent discount rate is determined to align the present value of the required cash flow with the value of the bond portfolio. The resulting discount rate is reflective of both the current interest rate environment and the plan's distinct liability characteristics.

The table below sets forth the estimated impact on our 2022 net periodic pension cost relative to a change in the discount rate and a change in the expected rate of return on plan assets.

In millions	**Impact on Pension Cost Increase/(Decrease)**
Discount rate used to value liabilities	
0.25 percent increase	$ (10)
0.25 percent decrease	16
Expected rate of return on assets	
1 percent increase	(55)
1 percent decrease	55

The above sensitivities reflect the impact of changing one assumption at a time. A higher discount rate decreases the plan obligations and decreases our net periodic pension cost. A lower discount rate increases the plan obligations and increases our net periodic pension cost. It should be noted that economic factors and conditions often affect multiple assumptions simultaneously and the effects of changes in key assumptions are not necessarily linear. Note 10, "PENSIONS AND OTHER POSTRETIREMENT BENEFITS," to our *Consolidated Financial Statements* provides a summary of our pension benefit plan activity, the funded status of our plans and the amounts recognized in our *Consolidated Financial Statements.*

ITEM 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to financial risk resulting from volatility in foreign exchange rates, interest rates and commodity prices. This risk is closely monitored and managed through the use of physical forward contracts (which are not considered derivatives), and financial derivative instruments including foreign currency forward contracts, commodity swap contracts and interest rate swaps. Financial derivatives are used expressly for hedging purposes and under no circumstances are they used for speculative purposes. When material, we adjust the estimated fair value of our derivative contracts for counterparty or our credit risk. None of our derivative instruments are subject to collateral requirements. Substantially all of our derivative contracts are subject to master netting arrangements, which provide us with the option to settle certain contracts on a net basis when they settle on the same day with the same currency. In addition, these arrangements provide for a net settlement of all contracts with a given counterparty in the event that the arrangement is terminated due to the occurrence of default or a termination event.

We also enter into physical forward contracts with certain suppliers to purchase minimum volumes of commodities at contractually stated prices for various periods. These arrangements, as further described below, enable us to fix the prices of portions of our normal purchases of these commodities, which otherwise are subject to market volatility.

The following describes our risk exposures and provides the results of a sensitivity analysis performed at December 31, 2021. The sensitivity analysis assumes instantaneous, parallel shifts in foreign currency exchange rates and commodity prices.

Foreign Currency Exchange Rate Risk

As a result of our international business presence, we are exposed to foreign currency exchange rate risks. We transact business in foreign currencies and, as a result, our income experiences some volatility related to movements in foreign currency exchange rates. To help manage our exposure to exchange rate volatility, we use foreign currency forward contracts on a regular basis to hedge forecasted intercompany and third-party sales and purchases denominated in non-functional currencies. Our foreign currency cash flow hedges generally mature within two years. These foreign currency forward contracts are designated and qualify as foreign currency cash flow hedges. For the years ended December 31, 2021 and 2020, there were no circumstances that resulted in the discontinuance of a foreign currency cash flow hedge.

To minimize the income volatility resulting from the remeasurement of net monetary assets and payables denominated in a currency other than the functional currency, we enter into foreign currency forward contracts, which are considered economic hedges. The objective is to offset the gain or loss from remeasurement with the gain or loss from the fair market valuation of the forward contract. These derivative instruments are not designated as hedges.

At December 31, 2021, the potential gain or loss in the fair value of our outstanding foreign currency contracts, assuming a hypothetical 10 percent fluctuation in the currencies of such contracts, would be approximately $103 million. The sensitivity analysis of the effects of changes in foreign currency exchange rates assumes the notional value to remain constant for the next 12 months. The analysis ignores the impact of foreign exchange movements on our competitive position and potential changes in sales levels. Any change in the value of the contracts, real or hypothetical, would be significantly offset by an inverse change in the value of the underlying hedged items.

Interest Rate Risk

We are exposed to market risk from fluctuations in interest rates. We manage our exposure to interest rate fluctuations through the use of interest rate swaps and interest rate locks. The objective of the swaps is to more effectively balance our borrowing costs and interest rate risk. See "Interest Rate Risk" section in Note 12, "DEBT," to our *Consolidated Financial Statements* for additional information.

At any time, a change in interest rates could have an adverse impact on the fair value of our portfolios. Assuming a hypothetical adverse movement in interest rates of one percentage point, the combined value of our interest rate derivatives portfolios would be reduced by $64 million, as calculated as of December 31, 2021. However, this does not take into consideration an offset in the underlying hedged items. While these are our best estimates of the impact of the specified interest rate scenario, actual results could differ from those projected. The sensitivity analysis presented assumes interest rate changes are instantaneous, parallel shifts in the yield curve.

Commodity Price Risk

We are exposed to fluctuations in commodity prices due to contractual agreements with component suppliers. In order to protect ourselves against future price volatility and, consequently, fluctuations in gross margins, we periodically enter into commodity swap and forward contracts with designated banks and other counterparties to fix the cost of certain raw material purchases with the objective of minimizing changes in inventory cost due to market price fluctuations. These commodity swaps are designated and qualify as cash flow hedges. At December 31, 2021, realized and unrealized gains and losses related to these hedges were not material to our financial statements. We also enter into physical forward contracts, which qualify for the normal purchases scope exceptions and are treated as purchase commitments.

We also limit our exposure to commodity price risk by entering into purchasing arrangements to fix the price of certain volumes of platinum and palladium expected to be used in our products. We enter into physical forward contracts with suppliers of platinum and palladium to purchase some volumes of the commodities at contractually stated prices for various periods, generally less than two years. These arrangements enable us to fix the prices of a portion of our purchases of these commodities, which otherwise are subject to market volatility.

ITEM 8. Financial Statements and Supplementary Data

Index to Financial Statements

MANAGEMENT'S REPORT TO SHAREHOLDERS

Management's Report on Financial Statements and Practices

The accompanying *Consolidated Financial Statements* of Cummins Inc. were prepared by management, which is responsible for their integrity and objectivity. The statements were prepared in accordance with generally accepted accounting principles and include amounts that are based on management's best judgments and estimates. The other financial information included in the annual report is consistent with that in the financial statements.

Management also recognizes its responsibility for conducting our affairs according to the highest standards of personal and corporate conduct. This responsibility is characterized and reflected in key policy statements issued from time to time regarding, among other things, conduct of its business activities within the laws of the host countries in which we operate, within the Foreign Corrupt Practices Act and potentially conflicting interests of its employees. We maintain a systematic program to assess compliance with these policies.

To comply with the requirements of Section 404 of the Sarbanes-Oxley Act of 2002, we designed and implemented a structured and comprehensive compliance process to evaluate our internal control over financial reporting across the enterprise.

Management's Report on Internal Control Over Financial Reporting

The management of Cummins Inc. is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and preparation of our *Consolidated Financial Statements* for external purposes in accordance with accounting principles generally accepted in the United States of America.

Management assessed the effectiveness of our internal control over financial reporting and concluded it was effective as of December 31, 2021. In making its assessment, management utilized the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control—Integrated Framework (2013).

The effectiveness of our internal control over financial reporting as of December 31, 2021, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

Officer Certifications

Please refer to Exhibits 31(a) and 31(b) attached to this report for certifications required under Section 302 of the Sarbanes-Oxley Act of 2002.

/s/ N. THOMAS LINEBARGER	/s/ MARK A. SMITH
Chairman and Chief Executive Officer	*Vice President and Chief Financial Officer*

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Cummins Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Cummins Inc. and its subsidiaries (the "Company") as of December 31, 2021 and 2020, and the related consolidated statements of net income, comprehensive income, changes in equity, and cash flows for each of the three years in the period ended December 31, 2021, 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, 2021, 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, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021 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, 2021, 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.

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

Critical Audit Matters

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

Goodwill Impairment Test - Automated Transmission Reporting Unit

As described in Notes 1 and 9 to the consolidated financial statements, the Company's consolidated goodwill balance was $1,287 million, and the goodwill associated with the Automated Transmission reporting unit was $544 million as of December 31, 2021. Management performs an impairment test as of the end of the fiscal third quarter each year, or more frequently if events or circumstances indicate the fair value of a reporting unit is less than its carrying amount. Management performs the annual or interim goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. Management's valuation method is an income approach using a discounted cash flow model. The discounted cash flow model requires projections of revenue, gross margin, operating expenses, working capital investment and fixed asset additions for the Automated Transmission reporting unit over a multi-year period, and a discount rate based upon a weighted-average cost of capital.

The principal considerations for our determination that performing procedures relating to the goodwill impairment test for the Automated Transmission reporting unit is a critical audit matter are (i) the significant judgment by management when developing the fair value of the Automated Transmission reporting unit; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating the significant assumptions related to projections of revenue and projections of gross margin; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment test, including controls over the valuation of the Automated Transmission reporting unit. These procedures also included, among others, testing management's process for developing the fair value of the Automated Transmission reporting unit. This included evaluating the appropriateness of the discounted cash flow model, testing the completeness and accuracy of underlying data used in the discounted cash flow model, and evaluating the reasonableness of significant assumptions used by management related to projections of revenue and projections of gross margin. Evaluating management's assumptions related to projections of revenue and projections of gross margin involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the Automated Transmission reporting unit and (ii) the consistency with external market and industry data. Professionals with specialized skill and knowledge were used to assist in the evaluation of the appropriateness of the Company's discounted cash flow model.

Base Product Warranty Liability

As described in Notes 1 and 13 to the consolidated financial statements, management estimates and records a liability for base product warranty programs at the time products are sold. As of December 31, 2021, the accrued liability for base product warranty programs was $1,439 million. The estimate for one of the base product warranty programs is based on historical experience and reflects management's best estimates of expected costs at the time products are sold and subsequent adjustment to those expected costs when actual costs differ. Management's estimate of the base product warranty liability is generally affected by component failure rates, repair costs, and the point of failure within the product life cycle.

The principal considerations for our determination that performing procedures relating to the base product warranty liability is a critical audit matter are (i) the significant judgment by management when determining the estimate for the base product warranty liability; and (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating the significant assumptions related to component failure rates, repair costs, and the point of failure within the product life cycle.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's estimate for the base product warranty liability, including controls related to the determination of component failure rates, repair costs, and the point of failure within the product life cycle. These procedures also included, among others, testing management's process for determining the base product warranty liability. This included evaluating the appropriateness of the method used by management, testing the completeness and accuracy of underlying data used in the warranty estimate, and evaluating the reasonableness of significant assumptions used by management related to the component failure rates, repair costs, and the point of failure within the product life cycle. Evaluating management's assumptions related to the component failure rates, repair costs, and the point of failure within the product life cycle involved evaluating whether the assumptions used by management were reasonable considering the historical product experience of the Company.

/s/PricewaterhouseCoopers LLP
Indianapolis, Indiana
February 8, 2022

We have served as the Company's auditor since 2002.

CUMMINS INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF NET INCOME

In millions, except per share amounts	Years ended December 31, 2021	2020	2019
NET SALES [a] (Note 2)	**$ 24,021**	$ 19,811	$ 23,571
Cost of sales	**18,326**	14,917	17,591
GROSS MARGIN	**5,695**	4,894	5,980
OPERATING EXPENSES AND INCOME			
Selling, general and administrative expenses	**2,374**	2,125	2,454
Research, development and engineering expenses	**1,090**	906	1,001
Equity, royalty and interest income from investees (Note 3)	**506**	452	330
Restructuring actions (Note 21)	**—**	—	119
Other operating expense, net	**(31)**	(46)	(36)
OPERATING INCOME	**2,706**	2,269	2,700
Interest expense (Note 12)	**111**	100	109
Other income, net	**156**	169	243
INCOME BEFORE INCOME TAXES	**2,751**	2,338	2,834
Income tax expense (Note 4)	**587**	527	566
CONSOLIDATED NET INCOME	**2,164**	1,811	2,268
Less: Net income attributable to noncontrolling interests	**33**	22	8
NET INCOME ATTRIBUTABLE TO CUMMINS INC.	**$ 2,131**	$ 1,789	$ 2,260
EARNINGS PER COMMON SHARE ATTRIBUTABLE TO CUMMINS INC. (Note 19)			
Basic	**$ 14.74**	$ 12.07	$ 14.54
Diluted	**$ 14.61**	$ 12.01	$ 14.48

[a] Includes sales to nonconsolidated equity investees of $ 1,713 million, $1,283 million and $ 1,191 million for the years ended December 31, 2021, 2020 and 2019, respectively.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

In millions	Years ended December 31, 2021	2020	2019
CONSOLIDATED NET INCOME	**$ 2,164**	$ 1,811	$ 2,268
Other comprehensive income (loss), net of tax (Note 16)			
Change in pension and other postretirement defined benefit plans	**389**	(1)	(63)
Foreign currency translation adjustments	**(9)**	71	(152)
Unrealized gain (loss) on derivatives	**26**	(34)	(11)
Total other comprehensive income (loss), net of tax	**406**	36	(226)
COMPREHENSIVE INCOME	**2,570**	1,847	2,042
Less: Comprehensive income attributable to noncontrolling interests	**28**	12	3
COMPREHENSIVE INCOME ATTRIBUTABLE TO CUMMINS INC.	**$ 2,542**	$ 1,835	$ 2,039

The accompanying notes are an integral part of our Consolidated Financial Statements.

CUMMINS INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

In millions, except par value	December 31, 2021	December 31, 2020
ASSETS		
Current assets		
Cash and cash equivalents	**$ 2,592**	$ 3,401
Marketable securities (Note 5)	**595**	461
Total cash, cash equivalents and marketable securities	**3,187**	3,862
Accounts and notes receivable, net		
Trade and other	**3,565**	3,440
Nonconsolidated equity investees	**425**	380
Inventories (Note 6)	**4,355**	3,425
Prepaid expenses and other current assets	**777**	790
Total current assets	**12,309**	11,897
Long-term assets		
Property, plant and equipment, net (Note 7)	**4,422**	4,255
Investments and advances related to equity method investees (Note 3)	**1,538**	1,441
Goodwill (Note 9)	**1,287**	1,293
Other intangible assets, net (Note 9)	**900**	963
Pension assets (Note 10)	**1,488**	1,042
Other assets (Note 11)	**1,766**	1,733
Total assets	**$ 23,710**	$ 22,624
LIABILITIES		
Current liabilities		
Accounts payable (principally trade)	**$ 3,021**	$ 2,820
Loans payable (Note 12)	**208**	169
Commercial paper (Note 12)	**313**	323
Accrued compensation, benefits and retirement costs	**683**	484
Current portion of accrued product warranty (Note 13)	**755**	674
Current portion of deferred revenue (Note 2)	**855**	691
Other accrued expenses (Note 11)	**1,190**	1,112
Current maturities of long-term debt (Note 12)	**59**	62
Total current liabilities	**7,084**	6,335
Long-term liabilities		
Long-term debt (Note 12)	**3,579**	3,610
Pensions and other postretirement benefits (Note 10)	**604**	630
Accrued product warranty (Note 13)	**684**	672
Deferred revenue (Note 2)	**850**	840
Other liabilities (Note 11)	**1,508**	1,548
Total liabilities	**$ 14,309**	$ 13,635
Commitments and contingencies (Note 14)		
EQUITY		
Cummins Inc. shareholders' equity (Note 15)		
Common stock, $2.50 par value, 500 shares authorized, 222.5 and 222.4 shares issued	**$ 2,427**	$ 2,404
Retained earnings	**16,741**	15,419
Treasury stock, at cost, 80.0 and 74.8 shares	**(9,123)**	(7,779)
Accumulated other comprehensive loss (Note 16)	**(1,571)**	(1,982)
Total Cummins Inc. shareholders' equity	**8,474**	8,062
Noncontrolling interests (Note 17)	**927**	927
Total equity	**$ 9,401**	$ 8,989
Total liabilities and equity	**$ 23,710**	$ 22,624

The accompanying notes are an integral part of our Consolidated Financial Statements.

CUMMINS INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
CASH FLOWS FROM OPERATING ACTIVITIES			
Consolidated net income	**$ 2,164**	$ 1,811	$ 2,268
Adjustments to reconcile consolidated net income to net cash provided by operating activities			
Depreciation and amortization	**662**	673	672
Deferred income taxes (Note 4)	**7**	7	(4)
Equity in income of investees, net of dividends	**(83)**	(105)	(14)
Pension and OPEB expense (Note 10)	**83**	108	75
Pension contributions and OPEB payments (Note 10)	**(102)**	(121)	(150)
Share-based compensation expense (Note 18)	**37**	31	49
Restructuring actions, net of cash payments	**(1)**	(110)	115
Gain on corporate owned life insurance	**—**	(57)	(61)
Foreign currency remeasurement and transaction exposure	**37**	2	(105)
Changes in current assets and liabilities, net of acquisitions			
Accounts and notes receivable	**(174)**	(51)	195
Inventories	**(945)**	46	291
Other current assets	**2**	(39)	(95)
Accounts payable	**217**	288	(310)
Accrued expenses	**541**	121	(112)
Changes in other liabilities	**(6)**	189	240
Other, net	**(183)**	(71)	127
Net cash provided by operating activities	**2,256**	2,722	3,181
CASH FLOWS FROM INVESTING ACTIVITIES			
Capital expenditures	**(734)**	(528)	(700)
Investments in internal use software	**(52)**	(47)	(75)
Proceeds from sale of land	**20**	—	—
Investments in and advances to equity investees	**(48)**	(51)	(20)
Acquisitions of businesses, net of cash acquired (Note 20)	**—**	—	(237)
Investments in marketable securities—acquisitions	**(806)**	(593)	(495)
Investments in marketable securities—liquidations (Note 5)	**673**	469	389
Cash flows from derivatives not designated as hedges	**49**	4	(44)
Other, net	**25**	27	32
Net cash used in investing activities	**(873)**	(719)	(1,150)
CASH FLOWS FROM FINANCING ACTIVITIES			
Proceeds from borrowings (Note 12)	**79**	2,014	11
Net payments of commercial paper	**(10)**	(337)	(120)
Payments on borrowings and finance lease obligations	**(73)**	(73)	(96)
Net (payments) borrowings under short-term credit agreements	**(28)**	10	53
Distributions to noncontrolling interests	**(28)**	(26)	(33)
Dividend payments on common stock (Note 15)	**(809)**	(782)	(761)
Repurchases of common stock (Note 15)	**(1,402)**	(641)	(1,271)
Proceeds from issuing common stock	**56**	88	76
Other, net	**(12)**	27	46
Net cash (used in) provided by financing activities	**(2,227)**	280	(2,095)
EFFECT OF EXCHANGE RATE CHANGES ON CASH AND CASH EQUIVALENTS	**35**	(11)	(110)
Net (decrease) increase in cash and cash equivalents	**(809)**	2,272	(174)
Cash and cash equivalents at beginning of year	**3,401**	1,129	1,303
CASH AND CASH EQUIVALENTS AT END OF PERIOD	**$ 2,592**	$ 3,401	$ 1,129

The accompanying notes are an integral part of our Consolidated Financial Statements.

CUMMINS INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

In millions	Common Stock	Additional Paid-in Capital	Retained Earnings	Treasury Stock	Common Stock Held in Trust	Accumulated Other Comprehensive Loss	Total Cummins Inc. Shareholders' Equity	Noncontrolling Interests	Total Equity
BALANCE AT DECEMBER 31, 2018	$ 556	$ 1,715	$ 12,917	$ (6,028)	$ (5)	$ (1,807)	$ 7,348	$ 911	$ 8,259
Net income			2,260				2,260	8	2,268
Other comprehensive loss, net of tax (Note 16)						(221)	(221)	(5)	(226)
Issuance of common stock		3					3	—	3
Employee benefits trust activity		34			3		37	—	37
Repurchases of common stock (Note 15)				(1,271)			(1,271)	—	(1,271)
Cash dividends on common stock (Note 15)			(761)				(761)	—	(761)
Distributions to noncontrolling interests							—	(33)	(33)
Share-based awards		2		74			76	—	76
Other shareholder transactions		36					36	77	113
BALANCE AT DECEMBER 31, 2019	$ 556	$ 1,790	$ 14,416	$ (7,225)	$ (2)	$ (2,028)	$ 7,507	$ 958	$ 8,465
Adoption of new accounting standards			(4)				(4)	—	(4)
Net income			1,789				1,789	22	1,811
Other comprehensive income (loss), net of tax (Note 16)						46	46	(10)	36
Issuance of common stock		10					10	—	10
Employee benefits trust activity		32			2		34	—	34
Repurchases of common stock (Note 15)				(641)			(641)	—	(641)
Cash dividends on common stock (Note 15)			(782)				(782)	—	(782)
Distributions to noncontrolling interests							—	(26)	(26)
Share-based awards		1		87			88	—	88
Other shareholder transactions		15					15	(17)	(2)
BALANCE AT DECEMBER 31, 2020	$ 556	$ 1,848	$ 15,419	$ (7,779)	$ —	$ (1,982)	$ 8,062	$ 927	$ 8,989
Net income			**2,131**				**2,131**	**33**	**2,164**
Other comprehensive income (loss), net of tax (Note 16)						**411**	**411**	**(5)**	**406**
Issuance of common stock		**1**					**1**	**—**	**1**
Repurchases of common stock (Note 15)				**(1,402)**			**(1,402)**	**—**	**(1,402)**
Cash dividends on common stock (Note 15)			**(809)**				**(809)**	**—**	**(809)**
Distributions to noncontrolling interests							**—**	**(28)**	**(28)**
Share-based awards		**1**		**55**			**56**	**—**	**56**
Other shareholder transactions		**21**		**3**			**24**	**—**	**24**
BALANCE AT DECEMBER 31, 2021	**$ 556**	**$ 1,871**	**$ 16,741**	**$ (9,123)**	**$ —**	**$ (1,571)**	**$ 8,474**	**$ 927**	**$ 9,401**

The accompanying notes are an integral part of our Consolidated Financial Statements.

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Nature of Operations

We were founded in 1919 as Cummins Engine Company, a corporation in Columbus, Indiana and one of the first diesel engine manufacturers. In 2001, we changed our name to Cummins Inc. We are a global power leader that designs, manufactures, distributes and services diesel, natural gas, electric and hybrid powertrains and powertrain-related components including filtration, aftertreatment, turbochargers, fuel systems, controls systems, air handling systems, automated transmissions, electric power generation systems, batteries, electrified power systems, hydrogen production and fuel cell products. We sell our products to original equipment manufacturers (OEMs), distributors, dealers and other customers worldwide. We serve our customers through a service network of approximately 500 wholly-owned, joint venture and independent distributor locations and more than 10,000 Cummins certified dealer locations in approximately 190 countries and territories.

COVID-19

The outbreak of COVID-19 in early 2020 became a global pandemic with the resultant economic impacts evolving into a worldwide recession. The pandemic triggered a significant downturn in our markets globally, which negatively impacted our sales and results of operations during 2020. While the majority of the negative impacts to demand largely subsided in 2021, we are still experiencing supply chain disruptions and related financial impacts reflected as increased cost of sales. Our industry continues to be unfavorably impacted by supply chain constraints leading to shortages across multiple components categories and limiting our collective ability to meet end-user demand. Our customers are also experiencing other supply chain issues and slowing production.

Principles of Consolidation

Our *Consolidated Financial Statements* are prepared in accordance with generally accepted accounting principles in the United States of America (GAAP)All intercompany balances and transactions are eliminated in consolidation.

We include the accounts of all wholly-owned and majority-owned domestic and foreign subsidiaries where our ownership is more than 50 percent of outstanding equity interests except for majority-owned subsidiaries that are considered variable interest entities (VIEs) where we are not deemed to have a controlling financial interest. In addition, we also consolidate, regardless of our ownership percentage, VIEs or joint ventures for which we are deemed to have a controlling financial interest. We have variable interests in several businesses accounted for under the equity method of accounting, however most of these VIEs are unconsolidated.

For consolidated entities where our ownership interest is less than 100 percent, the noncontrolling ownership interests are reported in our *Consolidated Balance Sheets*. The noncontrolling ownership interest in our income, net of tax, is classified as "Net income attributable to noncontrolling interests" in our *Consolidated Statements of Net Income*.

Reclassifications

Certain amounts for 2020 and 2019 were reclassified to conform to the current year presentation.

Investments in Equity Investees

We use the equity method to account for our investments in joint ventures, affiliated companies and alliances in which we have the ability to exercise significant influence, generally represented by equity ownership or partnership equity of at least 20 percent but not more than 50 percent. Generally, under the equity method, original investments in these entities are recorded at cost and subsequently adjusted by our share of equity in income or losses after the date of acquisition. Investment amounts in excess of our share of an investee's net assets are amortized over the life of the related asset creating the excess, except goodwill which is not amortized. Equity in income or losses of each investee is recorded according to our level of ownership; if losses accumulate, we record our share of losses until our investment has been fully depleted. If our investment has been fully depleted, we recognize additional losses only when we are the primary funding source. We eliminate (to the extent of our ownership percentage) in our *Consolidated Financial Statements* the profit in inventory held by our equity method investees that has not yet been sold to a third-party. Dividends received from equity method investees reduce the amount of our investment when received and do not impact our earnings. Our investments are classified as "Investments and advances related to equity method investees" in our *Consolidated Balance Sheets.* Our share of the results from joint ventures, affiliated companies and alliances is reported in our *Consolidated Statements of Net Income* as "Equity, royalty and interest income from investees," and is reported net of all applicable income taxes.

Our foreign equity investees are presented net of applicable foreign income taxes in our *Consolidated Statements of Net Income*. Our remaining U.S. equity investees are partnerships (non-taxable), thus there is no difference between gross or net of tax presentation as the investees are not taxed. See Note 3, "INVESTMENTS IN EQUITY INVESTEES," for additional information.

Use of Estimates in the Preparation of the Financial Statements

Preparation of financial statements requires management to make estimates and assumptions that affect reported amounts presented and disclosed in our *Consolidated Financial Statements*. Significant estimates and assumptions in these *Consolidated Financial Statements* require the exercise of judgement and are used for, but not limited to, estimates of future cash flows and other assumptions associated with goodwill and long-lived asset impairment tests, useful lives for depreciation and amortization, warranty programs, determination of discount rate and other assumptions for pensions and other postretirement benefit costs, restructuring costs, income taxes, deferred tax valuation allowances, contingencies and allowances for doubtful accounts. Due to the inherent uncertainty involved in making estimates, actual results reported in future periods may be different from these estimates.

Current supply chain disruptions and related future financial impacts cannot be estimated at this time. This uncertainty could have an impact on certain estimates used in the preparation of our 2021 financial results.

Revenue From Contracts with Customers

Revenue Recognition Sales of Products

We sell to customers either through long-term arrangements or standalone purchase orders. Our long-term arrangements generally do not include committed volumes until underlying purchase orders are issued. Our performance obligations vary by contract, but may include diesel and natural gas engines and engine-related component products, including filtration, aftertreatment, turbochargers, fuel systems, controls systems, air handling systems, automated transmissions, electric power generation systems and construction related projects, batteries, electrified power systems, hydrogen production and fuel cell products, parts, maintenance services and extended warranty coverage.

Typically, we recognize revenue on the products we sell at a point in time, generally in accordance with shipping terms, which reflects the transfer of control to the customer. Since control of construction projects transfer to the customer as the work is performed, revenue on these projects is recognized based on the percentage of inputs incurred to date compared to the total expected cost of inputs, which is reflective of the value transferred to the customer. Revenue is recognized under long-term maintenance and other service agreements over the term of the agreement as underlying services are performed based on the percentage of the cost of services provided to date compared to the total expected cost of services to be provided under the contract. Sales of extended coverage are recognized based on the pattern of expected costs over the extended coverage period or, if such a pattern is unknown, on a straight-line basis over the coverage period as the customer is considered to benefit from our stand ready obligation over the coverage period. In all cases, we believe cost incurred is the most representative depiction of the extent of service performed to date on a particular contract.

Our arrangements may include the act of shipping products to our customers after the performance obligation related to that product has been satisfied. We have elected to account for shipping and handling as activities to fulfill the promise to transfer goods and have not allocated revenue to the shipping activity. All related shipping and handling costs are accrued at the time the related performance obligation is satisfied.

Our sales arrangements may include the collection of sales and other similar taxes that are then remitted to the related taxing authority. We have elected to present the amounts collected for these taxes net of the related tax expense rather than presenting them as additional revenue.

We grant credit limits and terms to customers based upon traditional practices and competitive conditions. Typical terms vary by market, but payments are generally due in 90 days or less from invoicing for most of our product and service sales, while payments on construction and other similar arrangements may be due on an installment basis.

For contracts where the time between cash collection and performance is less than one year, we have elected to use the practical expedient that allows us to ignore the possible existence of a significant financing component within the contract. For contracts where this time period exceeds one year, generally the timing difference is the result of business concerns other than financing. We do have a limited amount of customer financing for which we charge or impute interest, but such amounts are immaterial to our *Consolidated Statements of Net Income.*

Sales Incentives

We provide various sales incentives to both our distribution network and OEM customers. These programs are designed to promote the sale of our products in the channel or encourage the usage of our products by OEM customers. When there is uncertainty surrounding these sales incentives, we may limit the amount of revenue we recognize under a contract until the uncertainty has been resolved. Sales incentives primarily fall into three categories:

- Volume rebates;
- Market share rebates; and

- Aftermarket rebates.

For volume rebates, we provide certain customers with rebate opportunities for attaining specified volumes during a particular quarter or year. We consider the expected amount of these rebates at the time of the original sale as we determine the overall transaction price. We update our assessment of the amount of rebates that will be earned quarterly based on our best estimate of the volume levels the customer will reach during the measurement period. For market share rebates, we provide certain customers with rebate opportunities based on the percentage of their production that utilizes our product. These rebates are typically measured either quarterly or annually and we assess them at least quarterly to determine our current estimates of amounts expected to be earned. These estimates are considered in the determination of transaction price at the time of the original sale based on the current market shares, with adjustments made as the level changes. For aftermarket rebates, we provide incentives to promote sales to certain dealers and end-markets. These rebates are typically paid on a quarterly, or more frequent basis. At the time of the sales, we consider the expected amount of these rebates when determining the overall transaction price. Estimates are adjusted at the end of each quarter based on the amounts yet to be paid. These estimates are based on historical experience with the particular program.

Sales Returns

The initial determination of the transaction price may also be impacted by expected product returns. Rights of return do not exist for the majority of our sales other than for quality issues. We do offer certain return rights in our aftermarket business, where some aftermarket customers are permitted to return small amounts of parts and filters each year, and in our power generation business, which sells portable generators to retail customers. An estimate of future returns is accounted for at the time of sale as a reduction in the overall contract transaction price based on historical return rates.

Multiple Performance Obligations

Our sales arrangements may include multiple performance obligations. We identify each of the material performance obligations in these arrangements and allocate the total transaction price to each performance obligation based on its relative selling price. In most cases, the individual performance obligations are also sold separately and we use that price as the basis for allocating revenue to the included performance obligations. When an arrangement includes multiple performance obligations and invoicing to the customer does not match the allocated portion of the transaction price, unbilled revenue or deferred revenue is recorded reflecting that difference. Unbilled and deferred revenue are discussed in more detail below.

Long-term Contracts

Our long-term maintenance agreements often include a variable component of the transaction price. We are generally compensated under such arrangements on a cost per hour of usage basis. We typically can estimate the expected usage over the life of the contract, but reassess the transaction price each quarter and adjust our recognized revenue accordingly. Certain maintenance agreements apply to generators used to provide standby power, which have limited expectations of usage. These agreements may include monthly minimum payments, providing some certainty to the total transaction price. For these particular contracts that relate to standby power, we limit revenue recognized to date to an amount representing the total minimums earned to date under the contract plus any cumulative billings earned in excess of the minimums. We reassess the estimates of progress and transaction price on a quarterly basis. For prime power arrangements, revenue is not subject to such a constraint and is generally equal to the current estimate on a percentage of completion basis times the total expected revenue under the contract.

Deferred Revenue

The timing of our billing does not always match the timing of our revenue recognition. We record deferred revenue when we are entitled to bill a customer in advance of when we are permitted to recognize revenue. Deferred revenue may arise in construction and other power generation system contracts, where billings may occur in advance of performance or in accordance with specific milestones. Deferred revenue may also occur in long-term maintenance contracts, where billings are often based on usage of the underlying equipment, which generally follows a predictable pattern that often will result in the accumulation of collections in advance of our performance of the related maintenance services. Finally, deferred revenue exists in our extended coverage contracts, where the cash is collected prior to the commencement of the coverage period. Deferred revenue is included in our *Consolidated Balance Sheets* as a component of current liabilities for the amount expected to be recognized in revenue in a period of less than one year and long-term liabilities for the amount expected to be recognized as revenue in a period beyond one year. Deferred revenue is recognized as revenue when control of the underlying product, project or service passes to the customer under the related contract.

Unbilled Revenue

We recognize unbilled revenue when the revenue has been earned, but not yet billed. Unbilled revenue is included in our*Consolidated Balance Sheets* as a component of current assets for those expected to be collected in a period of less than one year and long-term assets for those expected to be collected in a period beyond one year. Unbilled revenue relates to our right to consideration for our completed performance under a contract. Unbilled revenue generally arises from contractual provisions that delay a portion of the billings on genset deliveries until commissioning occurs. Unbilled revenue may also occur when billings trail the provision of service in construction and long-term maintenance contracts. Our unbilled revenue is assessed for collection risks at the time the amounts are initially recorded. This estimate of expected losses reflects those losses expected to occur over the contractual life of the unbilled amount through the time of collection. We did not record any impairment losses on our unbilled revenues during the years ended December 31, 2021, 2020 and 2019.

Contract Costs

We are required to record an asset for the incremental costs of obtaining a contract with a customer and other costs to fulfill a contract not otherwise required to be immediately expensed when we expect to recover those costs. The only material incremental cost we incur is commission expense, which is generally incurred in the same period as the underlying revenue. Costs to fulfill a contract are generally limited to customer-specific engineering expenses that do not meet the definition of research and development expenses. As a practical expedient, we have elected to recognize these costs of obtaining a contract as an expense when the related contract period is less than one year. When the period exceeds one year, this asset is amortized over the life of the contract. We did not have any material capitalized balances at December 31, 2021 or 2020.

Extended Warranty

We sell extended warranty coverage on most of our engines and on certain components. We consider a warranty to be extended coverage in any of the following situations:

- When a warranty is sold separately or is optional (extended coverage contracts, for example) or
- When a warranty provides additional services.

The consideration collected is initially deferred and is recognized as revenue in proportion to the costs expected to be incurred in performing services over the contract period. We compare the remaining deferred revenue balance quarterly to the estimated amount of future claims under extended warranty programs and provide an additional accrual when the deferred revenue balance is less than expected future costs.

Foreign Currency Transactions and Translation

We translate assets and liabilities of foreign entities to U.S. dollars, where the local currency is the functional currency, at month-end exchange rates. We translate income and expenses to U.S. dollars using weighted-average exchange rates. We record adjustments resulting from translation in a separate component of accumulated other comprehensive loss (AOCL) and include the adjustments in net income only upon sale, loss of controlling financial interest or liquidation of the underlying foreign investment.

Foreign currency transaction gains and losses are included in current net income. For foreign entities where the U.S. dollar is the functional currency, including those operating in highly inflationary economies when applicable, we remeasure non-monetary balances and the related income statement amounts using historical exchange rates. We include the resulting gains and losses in income, including the effect of derivatives in our *Consolidated Statements of Net Income*, which combined with transaction gains and losses amounted to a net gain of $2 million, $4 million and $28 million for the years ended December 31, 2021, 2020 and 2019, respectively.

Fair Value Measurements

A three-level valuation hierarchy, based upon the observable and unobservable inputs, is used for fair value measurements. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect market assumptions based on the best evidence available. These two types of inputs create the following fair value hierarchy:

- Level 1 - Quoted prices for *identical* instruments in active markets;
- Level 2 - Quoted prices for *similar* instruments in active markets, quoted prices for identical or similar instruments in markets that are not active and model-derived valuations whose significant inputs are observable; and
- Level 3 - Instruments whose significant inputs are *unobservable*.

Derivative Instruments

We make use of derivative instruments in foreign exchange, commodity price and interest rate hedging programs. Derivatives currently in use are foreign currency forward contracts, commodity swap and interest rate swaps and locks. These contracts are used strictly for hedging and not for speculative purposes.

We are exposed to market risk from fluctuations in interest rates. We manage our exposure to interest rate fluctuations through the use of interest rate swaps and locks. The objective is to more effectively balance our borrowing costs and interest rate risk for current and future exposure. The gain or loss on the swaps as well as the offsetting gain or loss on the hedged item are recognized in current income as "Interest expense." The gain or loss on the locks is deferred and reported as a component of AOCL. For more detail on our interest rate swaps, see Note 12, "DEBT."

Due to our international business presence, we are exposed to foreign currency exchange risk. We transact in foreign currencies and have assets, liabilities and investments in subsidiaries denominated in foreign currencies. Consequently, our income experiences some volatility related to movements in foreign currency exchange rates. In order to benefit from global diversification and after considering naturally offsetting currency positions, we enter into foreign currency forward contracts to minimize our existing exposures (recognized assets and liabilities) and hedge forecasted transactions. Foreign currency forward contracts are designated and qualify as foreign currency cash flow hedges. The unrealized gain or loss on the forward contract is deferred and reported as a component of AOCL. When the hedged forecasted transaction (sale or purchase) occurs, the unrealized gain or loss is reclassified into income in the same line item associated with the hedged transaction in the same period or periods during which the hedged transaction affects income. At December 31, 2021 and 2020, realized and unrealized gains and losses related to these hedges were not material to our financial statements.

To minimize the income volatility resulting from the remeasurement of net monetary assets and payables denominated in a currency other than the functional currency, we enter into foreign currency forward contracts, which are considered economic hedges. The objective is to offset the gain or loss from remeasurement with the gain or loss from the fair market valuation of the forward contract. These derivative instruments are not designated as hedges.

We are exposed to fluctuations in commodity prices due to contractual agreements with component suppliers. In order to protect ourselves against future price volatility and, consequently, fluctuations in gross margins, we periodically enter into commodity swap and forward contracts with designated banks and other counterparties to fix the cost of certain raw material purchases with the objective of minimizing changes in inventory cost due to market price fluctuations. These commodity swaps are designated and qualify as cash flow hedges. At December 31, 2021, realized and unrealized gains and losses related to these hedges were not material to our financial statements. We also enter into physical forward contracts, which qualify for the normal purchases scope exceptions and are treated as purchase commitments. Additional information on the physical forwards is included in Note 14, "COMMITMENTS AND CONTINGENCIES."

We record all derivatives at fair value in our financial statements. Cash flows related to derivatives that are designated as hedges are included in the cash flows from operating activities, while cash flows related to derivatives, that are not designated as hedges, are included in cash flows from investing activities in our *Consolidated Statements of Cash Flows*.

Substantially all of our derivative contracts are subject to master netting arrangements, which provide us with the option to settle certain contracts on a net basis when they settle on the same day with the same currency. In addition, these arrangements provide for a net settlement of all contracts with a given counterparty in the event that the arrangement is terminated due to the occurrence of default or a termination event. When material, we adjust the value of our derivative contracts for counter-party or our credit risk. None of our derivative instruments are subject to collateral requirements.

Income Tax Accounting

We determine our income tax expense using the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the future tax effects of temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis. Future tax benefits of net operating loss and credit carryforwards are also recognized as deferred tax assets. We evaluate the recoverability of our deferred tax assets each quarter by assessing the likelihood of future profitability and available tax planning strategies that could be implemented to realize our net deferred tax assets. A valuation allowance is recorded to reduce the tax assets to the net value management believes is more likely than not to be realized. In the event our operating performance deteriorates, future assessments could conclude that a larger valuation allowance will be needed to further reduce the deferred tax assets. In addition, we operate within multiple taxing jurisdictions and are subject to tax audits in these jurisdictions. These audits can involve complex issues, which may require an extended period of time to resolve. We accrue for the estimated additional tax and interest that may result from tax authorities disputing uncertain tax positions. We believe we made adequate provisions for income taxes for all years that are subject to audit based upon the latest information available. A more complete description of our income taxes and the future benefits of our net operating loss and credit carryforwards is disclosed in Note 4, "INCOME TAXES."

Cash and Cash Equivalents

Cash equivalents are defined as short-term, highly liquid investments with an original maturity of 90 days or less at the time of purchase. The carrying amounts reflected in our *Consolidated Balance Sheets* for cash and cash equivalents approximate fair value due to the short-term maturity of these investments.

Cash payments for income taxes and interest were as follows:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
Cash payments for income taxes, net of refunds	**$ 521**	$ 432	$ 691
Cash payments for interest, net of capitalized interest	**111**	88	109

Marketable Securities

Debt securities are classified as "held-to-maturity," "available-for-sale" or "trading." We determine the appropriate classification of debt securities at the time of purchase and re-evaluate such classifications at each balance sheet date. At December 31, 2021 and 2020, all of our debt securities were classified as available-for-sale. Debt and equity securities are carried at fair value with the unrealized gain or loss, net of tax, reported in other comprehensive income and other income, respectively. For debt securities, unrealized losses considered to be "other-than-temporary" are recognized currently in other income. The cost of securities sold is based on the specific identification method. The fair value of most investment securities is determined by currently available market prices. Where quoted market prices are not available, we use the market price of similar types of securities that are traded in the market to estimate fair value. See Note 5, "MARKETABLE SECURITIES," for a detailed description of our investments in marketable securities.

Accounts Receivable and Allowance for Doubtful Accounts

Trade accounts receivable represent amounts billed to customers and not yet collected or amounts that were earned, but may not be billed until the passage of time, and are recorded when the right to consideration becomes unconditional. Trade accounts receivable are recorded at the invoiced amount, which approximates net realizable value, and generally do not bear interest. The allowance for doubtful accounts is our best estimate of the amount of expected credit losses in our existing accounts receivable. We determine the allowance based on our historical collection experience and by performing an analysis of our accounts receivable in light of the current economic environment. This estimate of expected losses reflects those losses expected to occur over the contractual life of the receivable. We review our allowance for doubtful accounts on a regular basis. In addition, when necessary, we provide an allowance for the full amount of specific accounts deemed to be uncollectible. Account balances are charged off against the allowance in the period in which we determine that it is probable the receivable will not be recovered. The allowance for doubtful accounts balances were $33 million and $39 million at December 31, 2021, and 2020, respectively, and bad debt write-offs were not material.

Inventories

Our inventories are stated at the lower of cost or net realizable value. For the years ended December 31, 2021 and 2020, approximately 15 percent and 14 percent, respectively, of our consolidated inventories (primarily heavy-duty and high-horsepower engines and parts) were valued using the last-in, first-out (LIFO) cost method. The cost of other inventories is generally valued using the first-in, first-out (FIFO) cost method. Our inventories at interim and year-end reporting dates include estimates for adjustments related to annual physical inventory results and for inventory cost changes under the LIFO cost method. Due to significant movements of partially-manufactured components and parts between manufacturing plants, we do not internally measure, nor do our accounting systems provide, a meaningful segregation between raw materials and work-in-process. See Note 6, "INVENTORIES," for additional information.

Property, Plant and Equipment

We record property, plant and equipment at cost, inclusive of assets under finance lease assets. We depreciate the cost of the majority of our property, plant and equipment using the straight-line method with depreciable lives ranging from 20 to 40 years for buildings and 3 to 15 years for machinery, equipment and fixtures. Finance lease asset amortization is recorded in depreciation expense. We expense normal maintenance and repair costs as incurred. Depreciation expense totaled $514 million, $504 million and $494 million for the years ended December 31, 2021, 2020 and 2019, respectively. See Note 7, "PROPERTY, PLANT AND EQUIPMENT" and Note 8, "LEASES," for additional information.

Impairment of Long-Lived Assets

We review our long-lived assets for possible impairment whenever events or circumstances indicate that the carrying value of an asset or asset group may not be recoverable. We assess the recoverability of the carrying value of the long-lived assets at the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets and liabilities. An impairment of a long-lived asset or asset group exists when the expected future pre-tax cash flows (undiscounted and without interest charges) estimated to be generated by the asset or asset group is less than its carrying value. If these cash flows are less than the carrying value of such asset or asset group, an impairment loss is measured based on the difference between the estimated fair value and carrying value of the asset or asset group. Assumptions and estimates used to estimate cash flows in the evaluation of impairment and the fair values used to determine the impairment are subject to a degree of judgment and complexity. Any changes to the assumptions and estimates resulting from changes in actual results or market conditions from those anticipated may affect the carrying value of long-lived assets and could result in a future impairment charge.

Leases

We determine if an arrangement contains a lease in whole or in part at the inception of the contract. Right-of-use (ROU) assets represent our right to use an underlying asset for the lease term while lease liabilities represent our obligation to make lease payments arising from the lease. All leases greater than 12 months result in the recognition of a ROU asset and a liability at the lease commencement date based on the present value of the lease payments over the lease term. As most of our leases do not provide the information required to determine the implicit rate, we use our incremental borrowing rate based on the information available at commencement date in determining the present value of lease payments. This rate is determined considering factors such as the lease term, our credit standing and the economic environment of the location of the lease. We use the implicit rate when readily determinable.

Our lease terms include all non-cancelable periods and may include options to extend (or to not terminate) the lease when it is reasonably certain that we will exercise that option. Leases that have a term of 12 months or less at the commencement date are expensed on a straight-line basis over the lease term and do not result in the recognition of an asset or a liability.

Lease expense for operating leases is recognized on a straight-line basis over the lease term. Lease expense for finance leases are generally front-loaded as the finance lease ROU asset is depreciated on a straight-line basis, but interest expense on the liability is recognized utilizing the interest method that results in more expense during the early years of the lease. We have lease agreements with lease and non-lease components, primarily related to real estate, vehicle and information technology (IT) assets. For vehicle and real estate leases, we account for the lease and non-lease components as a single lease component. For IT leases, we allocate the payment between the lease and non-lease components based on the relative value of each component. See Note 8, "LEASES," for additional information.

Goodwill

We have the option to first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value as a basis for determining whether it is necessary to perform an annual quantitative goodwill impairment test. We elected this option on certain reporting units. The quantitative impairment test is only required if an entity determines through this qualitative analysis that it is more likely than not that the fair value of the reporting unit is less than its carrying value. In addition, the carrying value of goodwill must be tested for impairment on an interim basis in certain circumstances where impairment may be indicated. We perform our annual or interim goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. An impairment charge is recognized for the amount by which the carrying amount exceeds the reporting unit's fair value.

When we are required or opt to perform the quantitative impairment test, the fair value of each reporting unit is estimated with either the market approach or the income approach using a discounted cash flow model. Our income approach method uses a discounted cash flow model in which cash flows anticipated over several periods, plus a terminal value at the end of that time horizon, are discounted to their present value using an appropriate rate of return. Our reporting units are generally defined as one level below an operating segment. However, there are three situations where we have aggregated two or more reporting units which share similar economic characteristics and thus are aggregated into a single reporting unit for testing purposes. These three situations are described further below:

- Within our Components segment, our emission solutions and filtration businesses were aggregated into a single reporting unit,
- Within our New Power segment, our electrified power, fuel cell and hydrogen technologies businesses were aggregated into a single reporting unit and
- Our Distribution segment is considered a single reporting unit as it is managed geographically and all regions share similar economic characteristics and provide similar products and services.

The discounted cash flow model requires us to make projections of revenue, gross margin, operating expenses, working capital investment and fixed asset additions for the reporting units over a multi-year period. Additionally, management must estimate a weighted-average cost of capital, which reflects a market rate, for each reporting unit for use as a discount rate. The discounted cash flows are compared to the carrying value of the reporting unit and, if less than the carrying value, the difference is recorded as a goodwill impairment loss. In addition, we also perform a sensitivity analysis to determine how much our forecasts can fluctuate before the fair value of a reporting unit would be lower than its carrying amount. We perform the required procedures as of the end of our fiscal third quarter.

At December 31, 2021, our recorded goodwill was $1,287 million, of which approximately 42 percent or $544 million resided in the automated transmissions reporting unit, 30 percent in the aggregated emission solutions and filtration reporting unit, 20 percent in the new power reporting unit and 6 percent in the distribution reporting unit. Changes in our projections or estimates, a deterioration of our operating results and the related cash flow effect or a significant increase in the discount rate could decrease the estimated fair value of our reporting units and result in a future impairment of goodwill. See Note 9, "GOODWILL AND OTHER INTANGIBLE ASSETS," for additional information.

Other Intangible Assets

We capitalize other intangible assets, such as trademarks, patents and customer relationships, that were acquired either individually or with a group of other assets. These intangible assets are amortized on a straight-line basis over their estimated useful lives generally ranging from 3 to 25 years. Intangible assets are reviewed for impairment when events or circumstances indicate that the carrying value may not be recoverable over the remaining lives of the assets. See Note 9, "GOODWILL AND OTHER INTANGIBLE ASSETS," for additional information.

Software

We capitalize software that is developed or obtained for internal use. Software costs are amortized on a straight-line basis over their estimated useful lives generally ranging from 2 to 12 years. Software assets are reviewed for impairment when events or circumstances indicate that the carrying value may not be recoverable over the remaining lives of the assets. Upgrades and enhancements are capitalized if they result in significant modifications that enable the software to perform tasks it was previously incapable of performing. Software maintenance, training, data conversion and business process reengineering costs are expensed in the period in which they are incurred. See Note 9, "GOODWILL AND OTHER INTANGIBLE ASSETS," for additional information.

Warranty

We estimate and record a liability for base warranty programs at the time our products are sold. Our estimates are based on historical experience and reflect management's best estimates of expected costs at the time products are sold and subsequent adjustment to those expected costs when actual costs differ. Factors considered in developing these estimates included component failure rates, repair costs and the point of failure within the product life cycle. As a result of the uncertainty surrounding the nature and frequency of product campaigns, the liability for such campaigns is recorded when we commit to a recall action or when a recall becomes probable and estimable, which generally occurs when it is announced. The liability for these campaigns is reflected in the provision for warranties issued. We review and assess the liability for these programs on a quarterly basis. We also assess our ability to recover certain costs from our suppliers and record a receivable when we believe a recovery is probable. In addition to costs incurred on warranty and product campaigns, from time to time we also incur costs related to customer satisfaction programs for items not covered by warranty. We accrue for these costs when agreement is reached with a specific customer. These costs are not included in the provision for warranties, but are included in cost of sales. In addition, we sell extended warranty coverage on most of our engines. See *Extended Warranty* policy discussion above and Note 13, "PRODUCT WARRANTY LIABILITY," for additional information.

Research and Development

Our research and development programs are focused on product improvements, product extensions, innovations and cost reductions for our customers. Research and development expenditures include salaries, contractor fees, building costs, utilities, testing, technical information technology expenses, administrative expenses and allocation of corporate costs and are expensed, net of contract reimbursements, when incurred. From time to time, we enter into agreements with customers and government agencies to fund a portion of the research and development costs of a particular project. When not associated with a sales contract, we generally account for these reimbursements as an offset to the related research and development expenditure. Research and development expenses, net of contract reimbursements, were $1.1 billion, $903 million and $998 million for the years ended December 31, 2021, 2020 and 2019, respectively. Contract reimbursements were $104 million, $86 million and $90 million for the years ended December 31, 2021, 2020 and 2019, respectively.

Related Party Transactions

In accordance with the provisions of various joint venture agreements, we may purchase products and components from our joint ventures, sell products and components to our joint ventures and our joint ventures may sell products and components to unrelated parties. Joint venture transfer prices may differ from normal selling prices. Certain joint venture agreements transfer product at cost, some transfer product on a cost-plus basis, and others transfer product at market value. Our related party sales are presented on the face of our *Consolidated Statements of Net Income*. Our related party purchases were not material to our financial position or results of operations.

NOTE 2. REVENUE FROM CONTRACTS WITH CUSTOMERS

Long-term Contracts

The majority of our contracts are for a period of less than one year. We have certain long-term maintenance agreements, construction contracts and extended warranty coverage arrangements that span a period in excess of one year. The aggregate amount of the transaction price for long-term maintenance agreements and construction contracts allocated to performance obligations that were not satisfied as of December 31, 2021, was $740 million. We expect to recognize the related revenue of $114 million over the next 12 months and $626 million over periods up to 10 years. See Note 13,"PRODUCT WARRANTY LIABILITY," for additional disclosures on extended warranty coverage arrangements. Our other contracts generally are for a duration of less than one year, include payment terms that correspond to the timing of costs incurred when providing goods and services to our customers or represent sales-based royalties.

Deferred and Unbilled Revenue

The following is a summary of our unbilled and deferred revenue and related activity:

	Years ended December 31,	
In millions	2021	2020
Unbilled revenue	**$ 100**	$ 114
Deferred revenue, primarily extended warranty	**1,705**	1,531

We recognized revenue of $509 million and $372 million in 2021 and 2020, respectively, that was included in the deferred revenue balance at the beginning of each year. We did not record any impairment losses on our unbilled revenues during 2021 or 2020.

Disaggregation of Revenue

Consolidated Revenue

The table below presents our consolidated sales by geographic area. Net sales attributed to geographic areas were based on the location of the customer.

	Years ended December 31,		
In millions	2021	2020	2019
United States	**$ 12,489**	$ 10,605	$ 13,519
China	**3,169**	2,832	2,331
India	**1,133**	680	848
Other international	**7,230**	5,694	6,873
Total net sales	**$ 24,021**	$ 19,811	$ 23,571

Segment Revenue

Engine segment external sales by market were as follows:

	Years ended December 31,		
In millions	2021	2020	2019
Heavy-duty truck	**$ 2,511**	$ 1,800	$ 2,626
Medium-duty truck and bus	**1,978**	1,629	2,244
Light-duty automotive	**1,845**	1,441	1,656
Total on-highway	**6,334**	4,870	6,526
Off-highway	**1,255**	1,055	1,044
Total sales	**$ 7,589**	$ 5,925	$ 7,570

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Distribution segment external sales by region were as follows:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
North America	**$ 4,902**	$ 4,688	$ 5,513
Asia Pacific	**901**	799	875
Europe	**647**	597	528
Russia	**334**	191	157
China	**323**	340	356
Africa and Middle East	**259**	198	235
India	**194**	150	200
Latin America	**182**	147	176
Total sales	**$ 7,742**	$ 7,110	$ 8,040

Distribution segment external sales by product line were as follows:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
Parts	**$ 3,136**	$ 2,921	$ 3,278
Power generation	**1,754**	1,686	1,777
Engines	**1,493**	1,245	1,511
Service	**1,359**	1,258	1,474
Total sales	**$ 7,742**	$ 7,110	$ 8,040

Components segment external sales by business were as follows:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
Emission solutions	**$ 3,142**	$ 2,352	$ 2,763
Filtration	**1,171**	1,005	1,024
Turbo technologies	**787**	673	696
Automated transmissions	**481**	303	534
Electronics and fuel systems	**351**	317	236
Total sales	**$ 5,932**	$ 4,650	$ 5,253

Power Systems segment external sales by product line were as follows:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
Power generation	**$ 1,481**	$ 1,155	$ 1,414
Industrial	**820**	638	908
Generator technologies	**349**	262	348
Total sales	**$ 2,650**	$ 2,055	$ 2,670

NOTE 3. INVESTMENTS IN EQUITY INVESTEES

Investments and advances related to equity method investees and our ownership percentages were as follows:

Dollars in millions	Ownership percentage	December 31, 2021	December 31, 2020
Komatsu alliances	20-50%	**$ 275**	$ 309
Beijing Foton Cummins Engine Co., Ltd.	50%	**255**	255
Dongfeng Cummins Engine Company, Ltd.	50%	**148**	134
Chongqing Cummins Engine Company, Ltd.	50%	**144**	125
Cummins-Scania XPI Manufacturing, LLC	50%	**125**	99
Tata Cummins, Ltd.	50%	**88**	78
Other	Various	**503**	441
Investments and advances related to equity method investees		**$ 1,538**	$ 1,441

We have approximately $965 million in our investment account at December 31, 2021, that represents cumulative undistributed income in our equity investees. Dividends received from our unconsolidated equity investees were $336 million, $271 million and $260 million in 2021, 2020 and 2019, respectively.

Equity, royalty and interest income from investees, net of applicable taxes, was as follows:

In millions	Years ended December 31, 2021	2020	2019
Manufacturing entities			
Beijing Foton Cummins Engine Co., Ltd.	**$ 112**	$ 113	$ 60
Dongfeng Cummins Engine Company, Ltd.	**82**	63	52
Chongqing Cummins Engine Company, Ltd.	**39**	35	41
All other manufacturers	**149**	134 (1)(2)	88
Distribution entities			
Komatsu Cummins Chile, Ltda.	**32**	31	28
All other distributors	**10**	2	2
Cummins share of net income	**424**	378	271
Royalty and interest income	**82**	74	59
Equity, royalty and interest income from investees	**$ 506**	$ 452	$ 330

(1) Includes $37 million in favorable adjustments related to tax changes within India's 2020-2021 Union Budget of India (India Tax Law Change) passed in March 2020. See NOTE 4, "INCOME TAXES" for additional information on India Tax Law Change.

(2) Includes impairment charges of $ 13 million and loss on sale of business of $ 8 million for a joint venture in the Power Systems segment.

Manufacturing Entities

Our manufacturing joint ventures were generally formed with customers and are primarily intended to allow us to increase our market penetration in geographic regions, reduce capital spending, streamline our supply chain management and develop technologies. Our largest manufacturing joint ventures are based in China and are included in the list below. Our engine manufacturing joint ventures are supplied by our Components segment in the same manner as it supplies our wholly-owned Engine segment and Power Systems segment manufacturing facilities. Our Components segment joint ventures and wholly-owned entities provide electronics, fuel systems, filtration, aftertreatment systems, turbocharger products and automated transmissions that are used with our engines as well as some competitors' products. The results and investments in our joint ventures in which we have 50 percent or less ownership interest (except for Eaton Cummins Automated Transmission Technologies joint venture, which is consolidated due to our majority voting interest) are included in “Equity, royalty and interest income from investees” and “Investments and advances related to equity method investees” in our *Consolidated Statements of Net Income* and *Consolidated Balance Sheets*, respectively.

- ***Beijing Foton Cummins Engine Co., Ltd. -*** Beijing Foton Cummins Engine Co., Ltd. is a joint venture in China with Beiqi Foton Motor Co., Ltd., a commercial vehicle manufacturer, which has two distinct lines of business - a light-duty business and a heavy-duty business. The light-duty business produces our families of ISF 2.5 liter to 4.5 liter high performance light-duty diesel engines in Beijing. These engines are used in light-duty and medium-duty commercial trucks, pick-up trucks, buses, multipurpose and sport utility vehicles with main markets in China, Brazil and Russia. Certain types of small construction equipment and industrial applications are also served by these engine families. The heavy-duty business produces the X11, X12, X13 and X15, ranging from 10.5 liter to 14.5 liter, high performance heavy-duty diesel engines and natural gas engines in Beijing. Certain types of construction equipment and industrial applications are also served by these engine families.
- ***Dongfeng Cummins Engine Company, Ltd. -*** Dongfeng Cummins Engine Company, Ltd. (DCEC) is a joint venture in China with Dongfeng Automotive Co. Ltd., a subsidiary of Dongfeng Motor Corporation and one of the largest medium-duty and heavy-duty truck manufacturers in China. DCEC produces 3.9 liter to 14.5 liter diesel engines with a power range from 80 to 760 horsepower, natural gas engines and automated transmissions. On-highway engines are used in multiple applications in light-duty and medium-duty trucks, special purpose vehicles, buses and heavy-duty trucks with a main market in China. Off-highway engines are used in a variety of construction, power generation, marine and agriculture markets in China.
- ***Chongqing Cummins Engine Company, Ltd. -*** Chongqing Cummins Engine Company, Ltd. is a joint venture in China with Chongqing Machinery and Electric Co. Ltd. This joint venture manufactures several models of our heavy-duty and high-horsepower diesel engines primarily serving the industrial and stationary power markets in China.

Our joint venture agreement for Cummins Westport, Inc. expired on December 31, 2021, and will not be renewed. Beginning in January 2022, engines previously sold through the joint venture will now be included in our consolidated results.

Distribution Entities

We have an extensive worldwide distributor and dealer network through which we sell and distribute our products and services. Generally, our distributors are divided by geographic region with some of our distributors being wholly-owned by Cummins, some partially-owned and some independently owned. We consolidate all wholly-owned distributors and partially-owned distributors where we are the primary beneficiary and account for other partially-owned distributors using the equity method of accounting.

Komatsu Cummins Chile, Ltda. - Komatsu Cummins Chile, Ltda. is a joint venture with Komatsu America Corporation. The joint venture is a distributor that offers the full range of our products and services to customers and end-users in Chile and Peru.

In certain cases where we own a partial interest in a distributor, we may be obligated to purchase the other equity holders' interests if certain events occur (such as the death or resignation of the distributor principal or a change in control of Cummins Inc.). The purchase consideration of the equity interests may be determined based on the fair value of the distributor's assets. Repurchase obligations and practices vary by geographic region.

All distributors that are partially-owned are considered to be related parties in our *Consolidated Financial Statements.*

Equity Investee Financial Summary

Summary financial information for our equity investees was as follows:

	Years ended and at December 31,		
In millions	2021	2020	2019
Net sales	**$ 8,934**	$ 7,794	$ 7,068
Gross margin	**1,574**	1,418	1,274
Net income	**802**	696	566
Cummins share of net income	**$ 424**	$ 378	$ 271
Royalty and interest income	**82**	74	59
Total equity, royalty and interest from investees	**$ 506**	$ 452	$ 330
Current assets	**$ 4,587**	$ 4,264	
Long-term assets	**1,850**	1,673	
Current liabilities	**(3,573)**	(3,347)	
Long-term liabilities	**(288)**	(251)	
Net assets	**$ 2,576**	$ 2,339	
Cummins share of net assets	**$ 1,490**	$ 1,361	

NOTE 4. INCOME TAXES

The following table summarizes income before income taxes:

	Years ended December 31,		
In millions	2021	2020	2019
U.S. income	**$ 1,251**	$ 1,134	$ 1,677
Foreign income	**1,500**	1,204	1,157
Income before income taxes	**$ 2,751**	$ 2,338	$ 2,834

Income tax expense (benefit) consisted of the following:

In millions	Years ended December 31, 2021	2020	2019
Current			
U.S. federal and state	**$ 261**	$ 162	$ 288
Foreign	**319**	358	282
Total current income tax expense	**580**	520	570
Deferred			
U.S. federal and state	**(12)**	2	(32)
Foreign	**19**	22	28
Impact of India tax law changes	**—**	(17)	—
Total deferred income tax expense (benefit)	**7**	7	(4)
Income tax expense	**$ 587**	$ 527	$ 566

A reconciliation of the statutory U.S. federal income tax rate to the effective tax rate was as follows:

	Years ended December 31, 2021	2020	2019
Statutory U.S. federal income tax rate	**21.0 %**	21.0 %	21.0 %
State income tax, net of federal effect	**1.1**	1.0	1.1
Differences in rates and taxability of foreign subsidiaries and joint ventures	**0.1**	3.6	1.5
Research tax credits	**(0.6)**	(1.3)	(1.5)
Foreign derived intangible income	**(1.0)**	(1.2)	(1.3)
Impact of India tax law changes	**—**	(0.7)	—
Other, net	**0.7**	0.1	(0.8)
Effective tax rate	**21.3 %**	22.5 %	20.0 %

Our effective tax rate for 2021 was 21.3 percent compared to 22.5 percent for 2020 and 20.0 percent for 2019. The year ended December 31, 2021, contained unfavorable net discrete tax items of $9 million, primarily due to $12 million of unfavorable provision to return adjustments related to the 2020 filed tax returns, partially offset by $3 million of favorable other discrete tax items.

The year ended December 31, 2020, contained $26 million of unfavorable net discrete tax items, primarily due to $33 million of unfavorable changes in tax reserves and $10 million of withholding tax adjustments, partially offset by $15 million of favorable changes due to the India Tax Law Change. The India Tax Law Change eliminated the dividend distribution tax and replaced it with a lower rate withholding tax as the burden shifted from the dividend payor to the dividend recipient for a net favorable income statement impact of $35 million.

The India Tax Law Change resulted in the following adjustments to the *Consolidated Statements of Net Income* for the year ended December 31, 2020:

In millions	Favorable (Unfavorable)
Equity, royalty and interest income from investees	$ 37
Income tax expense [(1)]	17
Less: Net income attributable to noncontrolling interests	(19)
Net income statement impact	$ 35

(1) The adjustment to "Income tax expense" includes $15 million of favorable discrete items.

The year ended December 31, 2019, contained$34 million of favorable net discrete tax items, primarily due to withholding taxes and provision to return adjustments.

At December 31, 2021, $4.1 billion of non-U.S. earnings are considered indefinitely reinvested in operations outside the U.S. for which deferred taxes were not provided. Determination of the related deferred tax liability, if any, is not practicable because of the complexities associated with the hypothetical calculation.

Carryforward tax benefits and the tax effect of temporary differences between financial and tax reporting that give rise to net deferred tax assets (liabilities) were as follows:

	December 31,	
In millions	**2021**	**2020**
Deferred tax assets		
U.S. and state carryforward benefits	**$ 218**	$ 223
Foreign carryforward benefits	**177**	159
Employee benefit plans	**254**	273
Warranty expenses	**445**	445
Lease liabilities	**108**	107
Accrued expenses	**111**	93
Other	**78**	52
Gross deferred tax assets	**1,391**	1,352
Valuation allowance	**(360)**	(346)
Total deferred tax assets	**1,031**	1,006
Deferred tax liabilities		
Property, plant and equipment	**(272)**	(258)
Unremitted income of foreign subsidiaries and joint ventures	**(197)**	(185)
Employee benefit plans	**(355)**	(229)
Lease assets	**(105)**	(103)
Other	**(77)**	(77)
Total deferred tax liabilities	**(1,006)**	(852)
Net deferred tax assets	**$ 25**	$ 154

Our 2021 U.S. carryforward benefits include $218 million of state credit and net operating loss carryforward benefits that begin to expire in 2022. Our foreign carryforward benefits include $177 million of net operating loss carryforwards that begin to expire in 2022. A valuation allowance is recorded to reduce the gross deferred tax assets to an amount we believe is more likely than not to be realized. The valuation allowance is $360 million and increased in 2021 by a net $14 million. The valuation allowance is primarily attributable to the uncertainty regarding the realization of a portion of the U.S. state and foreign net operating loss and tax credit carryforward benefits.

Our *Consolidated Balance Sheets* contain the following tax related items:

In millions	December 31, 2021	2020
Prepaid expenses and other current assets		
Refundable income taxes	**$ 101**	$ 172
Other assets		
Deferred income tax assets	**428**	479
Long-term refundable income taxes	**—**	23
Other accrued expenses		
Income tax payable	**107**	82
Other liabilities		
Long-term income tax	**263**	289
Deferred income tax liabilities	**403**	325

A reconciliation of unrecognized tax benefits for the years ended December 31, 2021, 2020 and 2019 was as follows:

In millions	December 31, 2021	2020	2019
Balance at beginning of year	**$ 122**	$ 77	$ 71
Additions to current year tax positions	**11**	9	23
Additions to prior years' tax positions	**16**	49	5
Reductions to prior years' tax positions	**(28)**	(13)	(11)
Reductions for tax positions due to settlements with taxing authorities	**(32)**	—	(11)
Balance at end of year	**$ 89**	$ 122	$ 77

Included in the December 31, 2021, 2020 and 2019, balances are $85 million, $114 million and $69 million, respectively, related to tax positions that, if recognized, would favorably impact the effective tax rate in future periods. We also accrued interest expense related to the unrecognized tax benefits of $15 million, $17 million and $5 million as of December 31, 2021, 2020 and 2019, respectively. We recognize potential accrued interest and penalties related to unrecognized tax benefits in income tax expense.

Audit outcomes and the timing of audit settlements are subject to significant uncertainty. Although we believe that adequate provision has been made for such issues, there is the possibility that the ultimate resolution of such issues could have an adverse effect on our earnings. Conversely, if these issues are resolved favorably in the future, the related provision would be reduced, thus having a positive impact on earnings.

As a result of our global operations, we file income tax returns in various jurisdictions including U.S. federal, state and foreign jurisdictions. We are routinely subject to examination by taxing authorities throughout the world, including Australia, Belgium, Brazil, Canada, China, France, India, Mexico, the U.K. and the U.S. With few exceptions, our U.S. federal, major state and foreign jurisdictions are no longer subject to income tax assessments for years before 2017.

NOTE 5. MARKETABLE SECURITIES

A summary of marketable securities, all of which are classified as current, was as follows:

	December 31,					
	2021			2020		
In millions	Cost	Gross unrealized gains/(losses) [1]	Estimated fair value	Cost	Gross unrealized gains/(losses) [1]	Estimated fair value
Equity securities						
Certificates of deposit	**$ 299**	**$ —**	**$ 299**	$ 164	$ —	$ 164
Debt mutual funds	**254**	**2**	**256**	267	5	272
Equity mutual funds	**29**	**10**	**39**	19	5	24
Debt securities	**1**	**—**	**1**	1	—	1
Total marketable securities	**$ 583**	**$ 12**	**$ 595**	$ 451	$ 10	$ 461

[1] Unrealized gains and losses for debt securities are recorded in other comprehensive income while unrealized gains and losses for equity securities are recorded in "Other income, net" in our *Consolidated Statements of Net Income* .

All debt securities are classified as available-for-sale. All marketable securities presented use a Level 2 fair value measure. The fair value of Level 2 securities is estimated using actively quoted prices for similar instruments from brokers and observable inputs where available, including market transactions and third-party pricing services, or net asset values provided to investors. We do not currently have any Level 3 securities, and there were no transfers between Level 2 or 3 during 2021 or 2020.

A description of the valuation techniques and inputs used for our Level 2 fair value measures is as follows:

- *Certificates of deposit*— These investments provide us with a contractual rate of return and generally range in maturity fromthree months to five years. The counterparties to these investments are reputable financial institutions with investment grade credit ratings. Since these instruments are not tradable and must be settled directly by us with the respective financial institution, our fair value measure is the financial institution's month-end statement.
- *Debt mutual funds*— The fair value measures for the vast majority of these investments are the daily net asset values published on a regulated governmental website. Daily quoted prices are available from the issuing brokerage and are used on a test basis to corroborate this Level 2 input measure.
- *Equity mutual funds*— The fair value measures for these investments are the net asset values published by the issuing brokerage. Daily quoted prices are available from reputable third-party pricing services and are used on a test basis to corroborate this Level 2 input measure.
- *Debt securities*— The fair value measures for these securities are broker quotes received from reputable firms. These securities are infrequently traded on a national exchange and these values are used on a test basis to corroborate our Level 2 input measure.

The proceeds from sales and maturities of marketable securities were as follows:

	Years ended December 31,		
In millions	2021	2020	2019
Proceeds from sales of marketable securities	**$ 494**	$ 343	$ 258
Proceeds from maturities of marketable securities	**179**	126	131
Investments in marketable securities - liquidations	**$ 673**	$ 469	$ 389

NOTE 6. INVENTORIES

Inventories are stated at the lower of cost or net realizable value. Inventories included the following:

	December 31,	
In millions	2021	2020
Finished products	$ 2,538	$ 2,216
Work-in-process and raw materials	2,009	1,346
Inventories at FIFO cost	4,547	3,562
Excess of FIFO over LIFO	(192)	(137)
Total inventories	$ 4,355	$ 3,425

NOTE 7. PROPERTY, PLANT AND EQUIPMENT

Details of our property, plant and equipment balance were as follows:

	December 31,	
In millions	2021	2020
Land and buildings	$ 2,632	$ 2,613
Machinery, equipment and fixtures	5,910	5,851
Construction in process	816	547
Property, plant and equipment, gross	9,358	9,011
Less: Accumulated depreciation	(4,936)	(4,756)
Property, plant and equipment, net	$ 4,422	$ 4,255

NOTE 8. LEASES

Our lease portfolio consists primarily of real estate and equipment leases. Our real estate leases primarily consist of land, office, distribution, warehousing and manufacturing facilities. These leases typically range in term from 2 to 50 years and may contain renewal options for periods up to10 years at our discretion. Our equipment lease portfolio consists primarily of vehicles (including service vehicles), fork trucks and IT equipment. These leases typically range in term from two to three years and may contain renewal options. Our leases generally do not contain variable lease payments other than (1) certain foreign real estate leases which have payments indexed to inflation and (2) certain real estate executory costs (such as taxes, insurance and maintenance), which are paid based on actual expenses incurred by the lessor during the year. Our leases generally do not include residual value guarantees other than our service vehicle fleet, which has a residual guarantee based on a percentage of the original cost declining over the lease term.

The components of our lease cost were as follows:

	Years ended December 31,		
In millions	2021	2020	2019
Operating lease cost	$ 172	$ 172	$ 180
Finance lease cost			
Amortization of right-of-use asset	16	18	18
Interest expense	4	4	9
Short-term lease cost	18	19	33
Variable lease cost	11	12	7
Total lease cost	$ 221	$ 225	$ 247

Supplemental balance sheet information related to leases:

In millions	December 31, 2021	December 31, 2020	Balance Sheet Location
Assets			
Operating lease assets	**$ 444**	$ 438	Other assets
Finance lease assets[(1)]	**95**	99	Property, plant and equipment, net
Total lease assets	**$ 539**	$ 537	
Liabilities			
Current			
Operating lease liabilities	**$ 128**	$ 128	Other accrued expenses
Finance lease liabilities	**14**	12	Current maturities of long-term debt
Long-term			
Operating lease liabilities	**326**	325	Other liabilities
Finance lease liabilities	**75**	79	Long-term debt
Total lease liabilities	**$ 543**	$ 544	

[(1)] Finance lease assets were recorded net of accumulated amortization of $66 million and $ 58 million at December 31, 2021 and 2020.

Supplemental cash flow and other information related to leases:

In millions	Years ended December 31, 2021	2020	2019
Cash paid for amounts included in the measurement of lease liabilities			
Operating cash flows from operating leases	**$ 159**	$ 149	$ 163
Operating cash flows from finance leases	**14**	14	47
Financing cash flows from finance leases	**4**	4	9
Right-of-use assets obtained in exchange for lease obligations			
Operating leases	**$ 160**	$ 97	$ 214
Finance leases	**13**	19	5

Additional information related to leases:

	December 31, 2021	2020
Weighted-average remaining lease term (in years)		
Operating leases	**5.1**	4.9
Finance leases	**9.8**	10.8
Weighted-average discount rate		
Operating leases	**2.8 %**	3.4 %
Finance leases	**3.9 %**	4.0 %

Following is a summary of the future minimum lease payments due to finance and operating leases with terms of more than one year at December 31, 2021, together with the net present value of the minimum payments:

In millions	Finance Leases	Operating Leases
2022	$ 17	$ 138
2023	15	102
2024	12	76
2025	9	58
2026	8	39
After 2026	48	73
Total minimum lease payments	109	486
Interest	(20)	(32)
Present value of net minimum lease payments	$ 89	$ 454

NOTE 9. GOODWILL AND OTHER INTANGIBLE ASSETS

The following table summarizes the changes in the carrying amount of goodwill for the years ended December 31, 2021 and 2020:

In millions	Components	New Power	Distribution	Power Systems	Engine	Total
Balance at December 31, 2019	$ 934	$ 257	$ 79	$ 10	$ 6	$ 1,286
Translation and other	7	—	—	—	—	7
Balance at December 31, 2020	941	257	79	10	6	1,293
Acquisitions	**—**	**—**	**—**	**2**	**—**	**2**
Translation and other	**(7)**	**—**	**—**	**(1)**	**—**	**(8)**
Balance at December 31, 2021	**$ 934**	**$ 257**	**$ 79**	**$ 11**	**$ 6**	**$ 1,287**

Intangible assets that have finite useful lives are amortized over their estimated useful lives.The following table summarizes our other intangible assets with finite useful lives that are subject to amortization:

	December 31,	
In millions	2021	2020
Software	**$ 586**	$ 661
Less: Accumulated amortization	**(314)**	(372)
Software, net	**272**	289
Trademarks, patents, customer relationships and other	**957**	959
Less: Accumulated amortization	**(329)**	(285)
Trademarks, patents, customer relationships and other, net	**628**	674
Total other intangible assets, net	**$ 900**	$ 963

Amortization expense for software and other intangibles totaled $144 million, $165 million and $175 million for the years ended December 31, 2021, 2020 and 2019, respectively. The projected amortization expense of our intangible assets, assuming no further acquisitions or dispositions, is as follows:

In millions	2022	2023	2024	2025	2026
Projected amortization expense	$ 139	$ 128	$ 109	$ 76	$ 53

NOTE 10. PENSIONS AND OTHER POSTRETIREMENT BENEFITS

Pension Plans

We sponsor several pension plans covering substantially all employees. Generally, pension benefits for salaried employees are determined as a function of employee's compensation. Pension benefits for most hourly employees are determined similarly and as a function of employee's compensation, with the exception of a small group of hourly employees whose pension benefits were grandfathered in accordance with agreements with their union representation and are based on their years of service and compensation during active employment. The level of benefits and terms of vesting may vary among plans and are offered in accordance with applicable laws. Pension plans assets are administered by trustees and are principally invested in fixed income securities and equity securities. It is our policy to make contributions to our various qualified plans in accordance with statutory and contractual funding requirements, and any additional contributions we determine are appropriate.

Obligations, Assets and Funded Status

Benefit obligation balances presented below reflect the projected benefit obligation (PBO) for our pension plans.The changes in the benefit obligations, the various plan assets, the funded status of the plans and the amounts recognized in our *Consolidated Balance Sheets* for our significant pension plans at December 31 were as follows:

	Qualified and Non-Qualified Pension Plans			
	U.S. Plans		U.K. Plans	
In millions	**2021**	**2020**	**2021**	**2020**
Change in benefit obligation				
Benefit obligation at the beginning of the year	**$ 3,122**	$ 2,916	**$ 2,050**	$ 1,851
Service cost	**139**	133	**33**	29
Interest cost	**79**	95	**30**	36
Actuarial (gain) loss	**(132)**	224	**(136)**	136
Benefits paid from fund	**(178)**	(224)	**(63)**	(72)
Benefits paid directly by employer	**(18)**	(22)	**—**	—
Foreign currency translation adjustments	**—**	—	**(27)**	70
Benefit obligation at end of year	**$ 3,012**	$ 3,122	**$ 1,887**	$ 2,050
Change in plan assets				
Fair value of plan assets at beginning of year	**$ 3,429**	$ 3,357	**$ 2,337**	$ 2,010
Actual return on plan assets	**267**	274	**118**	268
Employer contributions	**30**	22	**30**	48
Benefits paid from fund	**(178)**	(224)	**(63)**	(72)
Foreign currency translation adjustments	**—**	—	**(32)**	83
Fair value of plan assets at end of year	**$ 3,548**	$ 3,429	**$ 2,390**	$ 2,337
Funded status (including unfunded plans) at end of year	**$ 536**	$ 307	**$ 503**	$ 287
Amounts recognized in consolidated balance sheets				
Pension assets	**$ 985**	$ 755	**$ 503**	$ 287
Accrued compensation, benefits and retirement costs	**(18)**	(17)	**—**	—
Pension and OPEB	**(431)**	(431)	**—**	—
Net amount recognized	**$ 536**	$ 307	**$ 503**	$ 287
Amounts recognized in accumulated other comprehensive loss				
Net actuarial loss	**$ 467**	$ 714	**$ 61**	$ 250
Prior service cost	**6**	6	**11**	19
Net amount recognized	**$ 473**	$ 720	**$ 72**	$ 269

In addition to the pension plans in the above table, we also maintain less significant defined benefit pension plans in 14 other countries outside of the U.S. and the U.K. that comprise approximately 4 percent and 5 percent of our pension plan assets and obligations, respectively, at December 31, 2021. These plans are reflected in "Other liabilities" on our *Consolidated Balance Sheets.* In 2021 and 2020, we made $13 million and $16 million of contributions to these plans, respectively.

The following table summarizes the total accumulated benefit obligation (ABO), the ABO for defined benefit pension plans with ABO in excess of plan assets and the PBO for defined benefit pension plans with PBO in excess of plan assets:

	Qualified and Non-Qualified Pension Plans			
	U.S. Plans		U.K. Plans	
In millions	2021	2020	2021	2020
Total ABO	**$ 2,986**	$ 3,091	**$ 1,844**	$ 1,954
Plans with ABO in excess of plan assets				
ABO	**424**	417	**—**	—
Plans with PBO in excess of plan assets				
PBO	**449**	448	**—**	—

Components of Net Periodic Pension Cost

The following table presents the net periodic pension cost under our plans for the years ended December 31:

	Qualified and Non-Qualified Pension Plans					
	U.S. Plans			U.K. Plans		
In millions	2021	2020	2019	2021	2020	2019
Service cost	**$ 139**	$ 133	$ 116	**$ 33**	$ 29	$ 26
Interest cost	**79**	95	108	**30**	36	43
Expected return on plan assets	**(199)**	(195)	(189)	**(85)**	(74)	(70)
Amortization of prior service cost	**1**	1	1	**2**	2	2
Recognized net actuarial loss	**47**	41	17	**31**	34	11
Net periodic pension cost	**$ 67**	$ 75	$ 53	**$ 11**	$ 27	$ 12

Other changes in benefit obligations and plan assets recognized in other comprehensive (income) loss for the years ended December 31 were as follows:

In millions	2021	2020	2019
Amortization of prior service cost	**$ (3)**	$ (3)	$ (3)
Recognized net actuarial loss	**(78)**	(75)	(28)
Incurred actuarial (gain) loss	**(368)**	85	101
Foreign currency translation adjustments	**5**	19	4
Total recognized in other comprehensive (income) loss	**$ (444)**	$ 26	$ 74
Total recognized in net periodic pension cost and other comprehensive (income) loss	**$ (366)**	$ 128	$ 139

Assumptions

The table below presents various assumptions used in determining the PBO for each year and reflects weighted-average percentages for the various plans as follows:

	Qualified and Non-Qualified Pension Plans			
	U.S. Plans		U.K. Plans	
	2021	2020	2021	2020
Discount rate	**3.01 %**	2.62 %	**1.95 %**	1.50 %
Cash balance crediting rate	**3.79 %**	3.74 %	**—**	—
Compensation increase rate	**2.71 %**	2.73 %	**3.75 %**	3.75 %

The table below presents various assumptions used in determining the net periodic pension cost and reflects weighted-average percentages for the various plans as follows:

	Qualified and Non-Qualified Pension Plans					
	U.S. Plans			U.K. Plans		
	2021	2020	2019	2021	2020	2019
Discount rate	**2.62 %**	3.36 %	4.36 %	**1.50 %**	2.00 %	2.80 %
Expected return on plan assets	**6.25 %**	6.25 %	6.25 %	**4.00 %**	4.00 %	4.00 %
Compensation increase rate	**2.72 %**	2.73 %	2.73 %	**3.75 %**	3.75 %	3.75 %

Plan Assets

Our investment policies in the U.S. and U.K. provide for the rebalancing of assets to maintain our long-term strategic asset allocation. We are committed to this long-term strategy and do not attempt to time the market. Given empirical evidence that asset allocation is critical, rebalancing of the assets has and continues to occur, maintaining the proper weighting of assets to achieve the expected total portfolio returns. We believe that our portfolio is highly diversified and does not have any significant exposure to concentration risk. The plan assets for our defined benefit pension plans do not include any of our common stock.

U.S. Plan Assets

For the U.S. qualified pension plans, our assumption for the expected return on assets was6.25 percent in 2021. Projected returns are based primarily on broad, publicly traded equity and fixed income indices and forward-looking estimates of active portfolio and investment management. We expect additional positive returns from this active investment management. Based on the historical returns and forward-looking return expectations, we elected to maintain our assumption of 6.25 percent in 2022.

The primary investment objective is to exceed, on a net-of-fee basis, the rate of return of a policy portfolio comprised of the following:

		Range	
Asset Class	Target	Minimum	Maximum
U.S. equities	5.0 %	— %	10 %
Non-U.S. equities	1.0 %	— %	4 %
Global equities	6.0 %	3 %	9 %
Total equities	12.0 %		
Real assets	6.0 %	— %	10 %
Private equity/venture capital	6.0 %	— %	10 %
Opportunistic credit	4.0 %	— %	10 %
Fixed income	72.0 %	67 %	77 %
Total	100.0 %		

The fixed income component is structured to represent a custom bond benchmark that will closely hedge the change in the value of our liabilities. This component is structured in such a way that its benchmark covers approximately 100 percent of the plan's exposure to changes in its discount rate (AA corporate bond yields). In order to achieve a hedge on more than the targeted 72 percent of plan assets invested in fixed income securities, our Benefits Policy Committee (BPC) permits the fixed income managers, other managers or the custodian/trustee to utilize derivative securities, as part of a liability driven investment strategy to further reduce the plan's risk of declining interest rates. However, all managers hired to manage assets for the trust are prohibited from using leverage unless approved by the BPC.

U.K. Plan Assets

For the U.K. qualified pension plans, our assumption for the expected return on assets was4.0 percent in 2021. The methodology used to determine the rate of return on pension plan assets in the U.K. was based on establishing an equity-risk premium over current long-term bond yields adjusted based on target asset allocations. Our strategy with respect to our investments in these assets is to be invested in a suitable mixture of return-seeking assets such as equities, real estate and liability matching assets such as group annuity insurance contracts and duration matched bonds. Therefore, the risk and return balance of our U.K. asset portfolio should reflect a long-term horizon. To achieve these objectives we established the following targets:

Asset Class	Target
Equities	10.0 %
Private markets/secure income assets	12.0 %
Credit	16.0 %
Diversifying strategies	5.0 %
Fixed income/insurance annuity	56.0 %
Cash	1.0 %
Total	100.0 %

As part of our strategy in the U.K. we have not prohibited the use of any financial instrument, including derivatives. As in the U.S. plan, derivatives may be used to better match liability duration and are not used in a speculative way. The 56 percent fixed income component is structured in a way that covers approximately90 percent of the plan's exposure to changes in its discount rate. Based on the above discussion, we elected an assumption of 3.75 percent in 2022.

Fair Value of U.S. Plan Assets

The fair values of U.S. pension plan assets by asset category were as follows:

	Fair Value Measurements at December 31, 2021			
In millions	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Equities				
U.S.	$ 115	$ —	$ —	$ 115
Non-U.S.	38	—	—	38
Fixed income				
Government debt	37	30	—	67
Corporate debt				
U.S.	—	489	—	489
Non-U.S.	—	19	—	19
Net cash equivalents (1)	270	57	—	327
Private markets and real assets (2)	—	—	551	551
Net plan assets subject to leveling	$ 460	$ 595	$ 551	$ 1,606
Pending trade/purchases/sales				2
Accruals (3)				6
Investments measured at net asset value				1,934
Net plan assets				$ 3,548

In millions	Fair Value Measurements at December 31, 2020 Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Equities				
U.S.	$ 194	$ —	$ —	$ 194
Non-U.S.	58	—	—	58
Fixed income				
Government debt	78	5	—	83
Corporate debt				
U.S.	—	512	—	512
Non-U.S.	—	26	—	26
Asset/mortgaged backed securities	—	3	—	3
Net cash equivalents [1]	319	37	—	356
Private markets and real assets [2]	—	—	431	431
Net plan assets subject to leveling	$ 649	$ 583	$ 431	$ 1,663
Accruals [3]				5
Investments measured at net asset value				1,761
Net plan assets				$ 3,429

(1) Cash equivalents include commercial paper, short-term government/agency, mortgage and credit instruments.

(2) The instruments in private markets and real assets, for which quoted market prices are not available, are valued at their estimated fair value as determined by applicable investment managers or by audited financial statements of the funds. Private markets include equity, venture capital and private credit instruments and funds. Real assets include real estate and infrastructure.

(3) Accruals include interest or dividends that were not settled at December 31.

Certain of our assets are valued based on their respective net asset value (NAV) (or its equivalent), as an alternative to estimated fair value due to the absence of readily available market prices. The fair value of each such investment category was as follows:

- *U.S. and Non-U.S. Corporate Debt* ($995 million and $1,068 million at December 31, 2021 and 2020, respectively) - These commingled funds have observable NAVs provided to investors and provide for liquidity either immediately or within a couple of days.
- *U.S. and Non-U.S. Equities* ($145 million and $245 million at December 31, 2021 and 2020, respectively) - These commingled funds have observable NAVs provided to investors and provide for liquidity either immediately or within a couple of days.
- *Government Debt* ($361 million and $199 million at December 31, 2021 and 2020, respectively) - These commingled funds have observable NAVs provided to investors and provide for liquidity either immediately or within a couple of days.
- *Real Estate* ($171 million and $153 million at December 31, 2021 and 2020, respectively) - This asset type represents different types of real estate including development property, industrial property, individual mortgages, office property, property investment companies and retail property. These funds are valued using NAVs and allow quarterly or more frequent redemptions.
- *Asset/Mortgage Backed Securities* ($262 million and $96 million at December 31, 2021 and 2020, respectively) - This asset type represents investments in fixed- and floating-rate loans. These funds are valued using NAVs and allow quarterly or more frequent redemptions.

The reconciliation of Level 3 assets was as follows:

In millions	Fair Value Measurements Using Significant Unobservable Inputs (Level 3) Private Markets	Real Assets	Total
Balance at December 31, 2019	$ 299	$ 72	$ 371
Actual return on plan assets			
Unrealized gains on assets still held at the reporting date	21	2	23
Purchases, sales and settlements, net	39	(2)	37
Balance at December 31, 2020	359	72	431
Actual return on plan assets			
Unrealized gains on assets still held at the reporting date	**144**	**11**	**155**
Purchases, sales and settlements, net	**(32)**	**(3)**	**(35)**
Balance at December 31, 2021	**$ 471**	**$ 80**	**$ 551**

Fair Value of U.K. Plan Assets

The fair values of U.K. pension plan assets by asset category were as follows:

In millions	Fair Value Measurements at December 31, 2021 Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Equities				
U.S.	**$ —**	**$ 79**	**$ —**	**$ 79**
Non-U.S.	**—**	**74**	**—**	**74**
Fixed income				
Net cash equivalents (1)	**35**	**—**	**—**	**35**
Insurance annuity (2)	**—**	**—**	**514**	**514**
Private markets and real assets (3)	**—**	**—**	**389**	**389**
Net plan assets subject to leveling	**$ 35**	**$ 153**	**$ 903**	**$ 1,091**
Investments measured at net asset value				**1,299**
Net plan assets				**$ 2,390**

In millions	Fair Value Measurements at December 31, 2020 Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Equities				
U.S.	$ —	$ 56	$ —	$ 56
Non-U.S.	—	69	—	69
Fixed income				
Net cash equivalents (1)	26	—	—	26
Insurance annuity (2)	—	—	556	556
Private markets and real assets (3)	—	—	282	282
Net plan assets subject to leveling	$ 26	$ 125	$ 838	$ 989
Investments measured at net asset value				1,348
Net plan assets				$ 2,337

(1) Cash equivalents include commercial paper, short-term government/agency, mortgage and credit instruments.

(2) In July 2012, the U.K. pension plan purchased an insurance contract that will guarantee payment of specified pension liabilities. The contract defers payment for 10 years.

(3) The instruments in private markets and real assets, for which quoted market prices are not available, are valued at their estimated fair value as determined by applicable investment managers or by audited financial statements of the funds. Private markets include equity, venture capital and private credit instruments and funds. Real assets include real estate and infrastructure.

Certain of our assets are valued based on their respective NAV (or its equivalent), as an alternative to estimated fair value due to the absence of readily available market prices. The fair value of each such investment category was as follows:

- *U.S. and Non-U.S. Corporate Debt* ($894 million and $970 million at December 31, 2021 and 2020, respectively) - These commingled funds have observable NAVs provided to investors and provide for liquidity either immediately or within a couple of days.
- *U.S. and Non-U.S. Equities* ($194 million and $168 million at December 31, 2021 and 2020, respectively) - These commingled funds have observable NAVs provided to investors and provide for liquidity either immediately or within a couple of days.
- *Asset/Mortgage Backed Securities* ($99 million and $100 million at December 31, 2021 and 2020, respectively) - This asset type represents investments in fixed- and floating-rate loans. These funds are valued using NAVs and allow quarterly or more frequent redemptions.
- *Re-insurance* ($61 million and $60 million at December 31, 2021 and 2020, respectively) - This commingled fund has a NAV that is determined on a monthly basis and the investment may be sold at that value.
- *Diversified Strategies* ($51 million and $50 million at December 31, 2021 and 2020, respectively) - These commingled funds invest in commodities, fixed income and equity securities. They have observable NAVs provided to investors and provide for liquidity either immediately or within a couple of days.

The reconciliation of Level 3 assets was as follows:

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)			
In millions	**Insurance Annuity**	**Real Assets**	**Private Markets**	**Total**
Balance at December 31, 2019	$ 476	$ 35	$ 224	$ 735
Actual return on plan assets				
Unrealized gains (losses) on assets still held at the reporting date	80	(2)	22	100
Purchases, sales and settlements, net	—	(2)	5	3
Balance at December 31, 2020	556	31	251	838
Actual return on plan assets				
Unrealized (losses) gains on assets still held at the reporting date	**(42)**	**2**	**114**	**74**
Purchases, sales and settlements, net	**—**	**—**	**(9)**	**(9)**
Balance at December 31, 2021	**$ 514**	**$ 33**	**$ 356**	**$ 903**

Level 3 Assets

The investments in an insurance annuity contract, venture capital, private equity and real estate, for which quoted market prices are not available, are valued at their estimated fair value as determined by applicable investment managers or by quarterly financial statements of the funds. These financial statements are audited at least annually. In conjunction with our investment consultant and actuary, we monitor the fair value of the insurance contract as periodically reported by our insurer and their counterparty risk. The fair value of all real estate properties, held in the partnerships, are valued at least once per year by an independent professional real estate valuation firm. Fair value generally represents the fund's proportionate share of the net assets of the investment partnerships as reported by the general partners of the underlying partnerships. Some securities with no readily available market are initially valued at cost, utilizing independent professional valuation firms as well as market comparisons with subsequent adjustments to values which reflect either the basis of meaningful third-party transactions in the private market or the fair value deemed appropriate by the general partners of the underlying investment partnerships. In such instances, consideration is also given to the financial condition and operating results of the issuer, the amount that the investment partnerships can reasonably expect to realize upon the sale of the securities and any other factors deemed relevant. The estimated fair values are subject to uncertainty and therefore may differ from the values that would have been used had a ready market for such investments existed and such differences could be material.

Estimated Future Contributions and Benefit Payments

We plan to contribute approximately $47 million to our defined benefit pension plans in 2022.The table below presents expected future benefit payments under our pension plans:

	Qualified and Non-Qualified Pension Plans					
In millions	**2022**	**2023**	**2024**	**2025**	**2026**	**2027 - 2031**
Expected benefit payments	$ 274	$ 261	$ 268	$ 271	$ 277	$ 1,411

Other Pension Plans

We also sponsor defined contribution plans for certain hourly and salaried employees. Our contributions to these plans were $92 million, $85 million and $102 million for the years ended December 31, 2021, 2020 and 2019.

Other Postretirement Benefits

Our other postretirement benefit (OPEB) plans provide various health care and life insurance benefits to eligible employees, who retire and satisfy certain age and service requirements, and their dependents. The plans are contributory and contain cost-sharing features such as caps, deductibles, coinsurance and spousal contributions. Employer contributions are limited by formulas in each plan. Retiree contributions for health care benefits are adjusted annually, and we reserve the right to change benefits covered under these plans. There were no plan assets for OPEB plans as our policy is to fund benefits and expenses for these plans as claims and premiums are incurred.

Obligations and Funded Status

Benefit obligation balances presented below reflect the accumulated postretirement benefit obligations for our OPEB plans.The changes in the benefit obligations, the funded status of the plans and the amounts recognized in our *Consolidated Balance Sheets* for our significant OPEB plans were as follows:

	December 31,	
In millions	**2021**	**2020**
Change in benefit obligation		
Benefit obligation at the beginning of the year	**$ 219**	$ 227
Interest cost	**5**	7
Plan participants' contributions	**14**	9
Actuarial (gain) loss	**(8)**	14
Benefits paid directly by employer	**(38)**	(38)
Benefit obligation at end of year	**$ 192**	$ 219
Funded status at end of year	**$ (192)**	$ (219)
Amounts recognized in consolidated balance sheets		
Accrued compensation, benefits and retirement costs	**$ (19)**	$ (20)
Pension and OPEB	**(173)**	(199)
Net amount recognized	**$ (192)**	$ (219)
Amounts recognized in accumulated other comprehensive loss		
Net actuarial gain	**$ (18)**	$ (10)
Prior service credit	**(4)**	(4)
Net amount recognized	**$ (22)**	$ (14)

In addition to the OPEB plans in the above table, we also maintain less significant OPEB plans in four other countries outside the U.S. that comprise approximately 8 percent and 9 percent of our OPEB obligations at December 31, 2021 and 2020, respectively. These plans are reflected in "Other liabilities" in our *Consolidated Balance Sheets.*

Components of Net Periodic OPEB Cost

The following table presents the net periodic OPEB cost under our plans:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
Interest cost	**$ 5**	$ 7	$ 10
Recognized net actuarial gain	**—**	(1)	—
Net periodic OPEB cost	**$ 5**	$ 6	$ 10

Other changes in benefit obligations recognized in other comprehensive (income) loss for the years ended December 31 were as follows:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
Recognized net actuarial gain	**$ —**	$ 1	$ —
Incurred actuarial (gain) loss	**(8)**	14	(1)
Total recognized in other comprehensive (income) loss	**$ (8)**	$ 15	$ (1)
Total recognized in net periodic OPEB cost and other comprehensive (income) loss	**$ (3)**	$ 21	$ 9

Assumptions

The table below presents assumptions used in determining the OPEB obligation for each year and reflects weighted-average percentages for our other OPEB plans as follows:

	2021	**2020**
Discount rate	**2.75 %**	2.30 %

The table below presents assumptions used in determining the net periodic OPEB cost and reflects weighted-average percentages for the various plans as follows:

	2021	**2020**	**2019**
Discount rate	**2.30 %**	3.15 %	4.25 %

Our consolidated OPEB obligation is determined by application of the terms of health care and life insurance plans, together with relevant actuarial assumptions and health care cost trend rates. For measurement purposes, a 6.75 percent annual rate of increase in the per capita cost of covered health care benefits was assumed in 2021. The rate is assumed to decrease on a linear basis to 5.0 percent through 2029 and remain at that level thereafter.

Estimated Benefit Payments

The table below presents expected benefit payments under our OPEB plans:

In millions	**2022**	**2023**	**2024**	**2025**	**2026**	**2027 - 2031**
Expected benefit payments	$ 19	$ 18	$ 18	$ 17	$ 16	$ 65

NOTE 11. SUPPLEMENTAL BALANCE SHEET DATA

Other assets included the following:

In millions	December 31, 2021	December 31, 2020
Corporate owned life insurance	**$ 492**	$ 508
Operating lease assets	**444**	438
Deferred income taxes	**428**	479
Other	**402**	308
Other assets	**$ 1,766**	$ 1,733

Other accrued expenses included the following:

In millions	December 31, 2021	December 31, 2020
Marketing accruals	**$ 303**	$ 242
Other taxes payable	**234**	256
Current portion of operating lease liabilities	**128**	128
Income taxes payable	**107**	82
Other	**418**	404
Other accrued expenses	**$ 1,190**	$ 1,112

Other liabilities included the following:

In millions	December 31, 2021	December 31, 2020
Deferred income taxes	**$ 403**	$ 325
Operating lease liabilities	**326**	325
Long-term income taxes	**263**	289
Accrued compensation	**177**	203
Mark-to-market valuation on interest rate swaps and locks	**19**	41
Other long-term liabilities	**320**	365
Other liabilities	**$ 1,508**	$ 1,548

NOTE 12. DEBT

Loans Payable and Commercial Paper

Loans payable at December 31, 2021 and 2020 were $208 million and $169 million, respectively, and consisted primarily of notes payable to financial institutions.The weighted-average interest rate for notes payable, bank overdrafts and current maturities of long-term debt at December 31 was as follows:

	2021	2020
Weighted-average interest rate	**2.71 %**	2.53 %

We can issue up to $3.5 billion of unsecured, short-term promissory notes (commercial paper) pursuant to the Board of Directors (the Board) authorized commercial paper programs. The programs facilitate the private placement of unsecured short-term debt through third-party brokers. We intend to use the net proceeds from the commercial paper borrowings for general corporate purposes. We had $313 million and $323 million in outstanding borrowings under our commercial paper programs at December 31, 2021 and 2020, respectively. The weighted-average interest rate for commercial paper at December 31 was as follows:

	2021	2020
Weighted-average interest rate	**(0.01)%** (1)	(0.01)% (2)

(1) The weighted-average interest rate, inclusive of all brokerage fees, was negative 0.01 percent at December 31, 2021. This included $113 million of borrowings under the Europe program that were at a negative weighted-average interest rate of 0.39 percent and $200 million of borrowings under the U.S. program at a weighted-average interest rate of 0.21 percent.

(2) The weighted-average interest rate, inclusive of all brokerage fees, was negative 0.01 percent at December 31, 2020. This included $123 million of borrowings under the Europe program that were at a negative weighted-average interest rate of 0.34 percent and $200 million of borrowings under the U.S. program at a weighted-average interest rate of 0.19 percent.

Revolving Credit Facilities

On August 18, 2021, we entered into an amended and restated 5-year revolving credit agreement, which allows us to borrow up to $2 billion of unsecured funds at any time prior to August 18, 2026. This credit agreement replaces the prior $2 billion 5-year credit agreement that would have matured on August 22, 2023. Amounts payable under our revolving credit facility will rank pro rata with all of our unsecured, unsubordinated indebtedness. Up to $300 million under this credit facility is available for swingline loans. Based on our current long-term debt ratings, the applicable margin on LIBOR rate loans was 0.75 percent per annum as of December 31, 2021. Advances under the facility may be prepaid without premium or penalty, subject to customary breakage costs.

On August 18, 2021, we also entered into an amended and restated 364-day credit agreement, which allows us to borrow up to $1.5 billion of unsecured funds at any time prior to August 17, 2022. This credit agreement amended and restated the prior $1.5 billion 364-day credit facility that matured on August 18, 2021.

Both credit agreements include various covenants, including, among others, maintaining a net debt to total capital ratio of no more than 0.65 to 1.0. At December 31, 2021, we were in compliance with the financial debt covenants. We intend to maintain credit facilities at the current or higher aggregate amounts by renewing or replacing these facilities at or before expiration. These revolving credit facilities are maintained primarily to provide backup liquidity for our commercial paper borrowings and for general corporate purposes. There were no outstanding borrowings under these facilities at December 31, 2021.

At December 31, 2021, our $313 million of commercial paper outstanding effectively reduced the $3.5 billion available capacity under our revolving credit facilities to $3.2 billion.

At December 31, 2021, we also had $234 million available for borrowings under our international and other domestic credit facilities.

Long-term Debt

A summary of long-term debt was as follows:

In millions	Interest Rate	December 31, 2021	December 31, 2020
Long-term debt			
Senior notes, due 2023	3.65%	**$ 500**	$ 500
Senior notes, due 2025 [1]	0.75%	**500**	500
Debentures, due 2027	6.75%	**58**	58
Debentures, due 2028	7.125%	**250**	250
Senior notes, due 2030 [1]	1.50%	**850**	850
Senior notes, due 2043	4.875%	**500**	500
Senior notes, due 2050	2.60%	**650**	650
Debentures, due 2098 [2]	5.65%	**165**	165
Other debt		**110**	132
Unamortized discount and deferred issuance costs		**(68)**	(72)
Fair value adjustments due to hedge on indebtedness		**34**	48
Finance leases		**89**	91
Total long-term debt		**3,638**	3,672
Less: Current maturities of long-term debt		**59**	62
Long-term debt		**$ 3,579**	$ 3,610

[1] In 2021 we entered into a series of interest rate swaps to effectively convert from a fixed rate to floating rate. See "Interest Rate Risk" below for additional information.
[2] The effective interest rate is 7.48%.

Principal payments required on long-term debt during the next five years are as follows:

In millions	2022	2023	2024	2025	2026
Principal payments	$ 59	$ 536	$ 31	$ 507	$ 24

On August 24, 2020, we issued $2 billion aggregate principal amount of senior unsecured notes consisting of $500 million aggregate principal amount of 0.75 percent senior unsecured notes due in 2025, $850 million aggregate principal amount of 1.50 percent senior unsecured notes due in 2030 and $650 million aggregate principal amount of 2.60 percent senior unsecured notes due in 2050. We received net proceeds of $1.98 billion. The senior unsecured notes pay interest semi-annually on March 1 and September 1, commencing on March 1, 2021. The indenture governing the senior unsecured notes contains covenants that, among other matters, limit (i) our ability to consolidate or merge into, or sell, assign, convey, lease, transfer or otherwise dispose of all or substantially all of our and our subsidiaries' assets to another person, (ii) our and certain of our subsidiaries' ability to create or assume liens and (iii) our and certain of our subsidiaries' ability to engage in sale and leaseback transactions.

The $250 million 7.125 percent debentures and $165 million 5.65 percent debentures are unsecured and are not subject to any sinking fund requirements. We can redeem these debentures at any time prior to maturity at the greater of par plus accrued interest or an amount designed to ensure that the debenture holders are not penalized by the early redemption.

Our debt agreements contain several restrictive covenants. The most restrictive of these covenants applies to our revolving credit facility which will upon default, among other things, limit our ability to incur additional debt or issue preferred stock, enter into sale-leaseback transactions, sell or create liens on our assets, make investments and merge or consolidate with any other entity. At December 31, 2021, we were in compliance with all of the financial debt covenants under our borrowing agreements.

Shelf Registration

As a well-known seasoned issuer, we filed an automatic shelf registration for an undetermined amount of debt and equity securities with the Securities and Exchange Commission (SEC) on February 13, 2019. Under this shelf registration we may offer, from time to time, debt securities, common stock, preferred and preference stock, depositary shares, warrants, stock purchase contracts and stock purchase units. Our current shelf is scheduled to expire in February 2022. We have begun the renewal process and plan to file a new automatic shelf registration statement in the first quarter of 2022.

Interest Expense

For the years ended December 31, 2021, 2020 and 2019, total interest incurred was $113 million, $102 million and $112 million, respectively, and interest capitalized was $2 million, $2 million and $3 million, respectively.

Interest Rate Risk

In the second half of 2021, we entered into a series of interest rate swaps to effectively convert our $500 million senior notes, due in 2025, from a fixed rate of 0.75 percent to a floating rate equal to the three-month LIBOR plus a spread. We also entered into a series of interest rate swaps to effectively convert $765 million of our $850 million senior notes, due in 2030, from a fixed rate of 1.50 percent to a floating rate equal to the three-month LIBOR plus a spread. The swaps were designated, and will be accounted for, as fair value hedges. The gain or loss on these derivative instruments, as well as the offsetting gain or loss on the hedged item attributable to the hedged risk, are recognized in current income as "Interest expense." The net swap settlements that accrue each period are also reported in the *Consolidated Financial Statements* as "Interest expense."

We had a series of interest rate swaps to effectively convert our September 2013, $500 million debt issue, due in 2023, from a fixed rate of 3.65 percent to a floating rate equal to the one-month LIBOR plus a spread. The debt is included in the *Consolidated Balance Sheets* as "Long-term debt." The terms of the swaps mirrored those of the debt, with interest paid semi-annually. The swaps were designated, and were accounted for, as fair value hedges. The gain or loss on these derivative instruments, as well as the offsetting gain or loss on the hedged item attributable to the hedged risk, were recognized in current income as "Interest expense." The net swap settlements that accrued each period were also reported in the *Consolidated Financial Statements* as "Interest expense." A basis adjustment related to credit risk, excluded from the assessment of effectiveness, was being amortized over the life of the hedge using a straight-line method and was considered de minimis.

In June and July of 2020, we settled our February 2014 interest rate swaps, which previously converted our $500 million debt issue, due in 2023, from fixed rate to floating rate based on a LIBOR spread. The $24 million gain realized upon settlement is being amortized over the remaining three-year term of the related debt.

The following table summarizes the gains and losses:

	Years ended December 31,					
In millions	**2021**		**2020**		**2019**	
Type of Swap	**Gain (Loss) on Swaps**	**Gain (Loss) on Borrowings**	**Gain (Loss) on Swaps**	**Gain (Loss) on Borrowings**	**Gain (Loss) on Swaps**	**Gain (Loss) on Borrowings**
Interest rate swaps[(1)]	**$ (3)**	**$ 2**	$ 7	$ (5)	$ 16	$ (14)

[(1)] The difference between the gain (loss) on swaps and borrowings represented hedge ineffectiveness.

In 2019 we entered into $350 million of interest rate lock agreements, and in the first half of 2020 we entered into an additional $150 million of lock agreements to reduce the variability of the cash flows of the interest payments on a total of $500 million of fixed rate debt forecast to be issued in 2023 to replace our senior notes at maturity. The terms of the rate locks mirror the time period of the expected fixed rate debt issuance and the expected timing of interest payments on that debt. The gains and losses on these derivative instruments will be initially recorded in other comprehensive income and will be released to earnings in "Interest expense" in future periods to reflect the difference in (1) the fixed rates economically locked in at the inception of the hedge and (2) the actual fixed rates established in the debt instrument at issuance.

The following table summarizes the interest rate lock activity in AOCL:

In millions	Year ended December 31, 2021		2020		2019	
Type of Swap	Gain (Loss) Recognized in AOCL	Gain (Loss) Reclassified from AOCL into Interest Expense	Gain (Loss) Recognized in AOCL	Gain (Loss) Reclassified from AOCL into Interest Expense	Gain (Loss) Recognized in AOCL	Gain (Loss) Reclassified from AOCL into Interest Expense
Interest rate locks	**$ 19**	**$ —**	(22)	—	(10)	—

Fair Value of Debt

Based on borrowing rates currently available to us for bank loans with similar terms and average maturities, considering our risk premium, the fair values and carrying values of total debt, including current maturities, were as follows:

In millions	December 31, 2021	2020
Fair values of total debt [1]	**$ 4,461**	$ 4,665
Carrying value of total debt	**4,159**	4,164

[1] The fair value of debt is derived from Level 2 input measures.

NOTE 13. PRODUCT WARRANTY LIABILITY

A tabular reconciliation of the product warranty liability, including the deferred revenue related to our extended warranty coverage and accrued product campaigns, was as follows:

In millions	December 31, 2021	2020	2019
Balance, beginning of year	**$ 2,307**	$ 2,389	$ 2,208
Provision for base warranties issued	**503**	443	458
Deferred revenue on extended warranty contracts sold	**288**	248	356
Provision for product campaigns issued	**346**	90	210
Payments made during period	**(530)**	(589)	(590)
Amortization of deferred revenue on extended warranty contracts	**(260)**	(227)	(230)
Changes in estimates for pre-existing product warranties	**(228)**	(52)	(24)
Foreign currency translation and other	**(1)**	5	1
Balance, end of year	**$ 2,425**	$ 2,307	$ 2,389

We recognized supplier recoveries of $170 million, $20 million and $67 million for the years ended December 31, 2021, 2020 and 2019, respectively.

Warranty related deferred revenues and warranty liabilities on our *Consolidated Balance Sheets* were as follows:

In millions	December 31, 2021	December 31, 2020	Balance Sheet Location
Deferred revenue related to extended coverage programs			
Current portion	**$ 286**	$ 261	Current portion of deferred revenue
Long-term portion	**700**	700	Deferred revenue
Total	**$ 986**	$ 961	
Product warranty			
Current portion	**$ 755**	$ 674	Current portion of accrued product warranty
Long-term portion	**684**	672	Accrued product warranty
Total	**$ 1,439**	$ 1,346	
Total warranty accrual	**$ 2,425**	$ 2,307	

Engine System Campaign Accrual

During 2017, the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) selected certain of our pre-2013 model year engine systems for additional emissions testing. Some of these engine systems failed CARB and EPA tests as a result of degradation of an aftertreatment component. In the second quarter of 2018, we reached agreement with the CARB and EPA regarding our plans to address the affected populations. From the fourth quarter of 2017 through the second quarter of 2018, we recorded charges for the expected costs of field campaigns to repair these engine systems.

The campaigns launched in the third quarter of 2018 are being completed in phases across the affected population. The total engine system campaign charge, excluding supplier recoveries, was $410 million. In the fourth quarter of 2020, we recorded an additional $20 million charge related to this campaign, as a change in estimate, to bring the total campaign, excluding supplier recoveries, to $430 million. At December 31, 2021, the remaining accrual balance was $82 million.

NOTE 14. COMMITMENTS AND CONTINGENCIES

Legal Proceedings

We are subject to numerous lawsuits and claims arising out of the ordinary course of our business, including actions related to product liability; personal injury; the use and performance of our products; warranty matters; product recalls; patent, trademark or other intellectual property infringement; contractual liability; the conduct of our business; tax reporting in foreign jurisdictions; distributor termination; workplace safety; and environmental matters. We also have been identified as a potentially responsible party at multiple waste disposal sites under U.S. federal and related state environmental statutes and regulations and may have joint and several liability for any investigation and remediation costs incurred with respect to such sites. We have denied liability with respect to many of these lawsuits, claims and proceedings and are vigorously defending such lawsuits, claims and proceedings. We carry various forms of commercial, property and casualty, product liability and other forms of insurance; however, such insurance may not be applicable or adequate to cover the costs associated with a judgment against us with respect to these lawsuits, claims and proceedings. We do not believe that these lawsuits are material individually or in the aggregate. While we believe we have also established adequate accruals for our expected future liability with respect to pending lawsuits, claims and proceedings, where the nature and extent of any such liability can be reasonably estimated based upon then presently available information, there can be no assurance that the final resolution of any existing or future lawsuits, claims or proceedings will not have a material adverse effect on our business, results of operations, financial condition or cash flows.

We conduct significant business operations in Brazil that are subject to the Brazilian federal, state and local labor, social security, tax and customs laws. While we believe we comply with such laws, they are complex, subject to varying interpretations and we are often engaged in litigation regarding the application of these laws to particular circumstances.

On April 29, 2019, we announced that we were conducting a formal internal review of our emissions certification process and compliance with emission standards for our pick-up truck applications, following conversations with the EPA and CARB regarding certification of our engines in model year 2019 RAM 2500 and 3500 trucks. This review is being conducted with external advisors as we strive to ensure the certification and compliance processes for all of our pick-up truck applications are consistent with our internal policies, engineering standards and applicable laws. During conversations with the EPA and CARB about the effectiveness of our pick-up truck applications, the regulators raised concerns that certain aspects of our emissions systems may reduce the effectiveness of our emissions control systems and thereby act as defeat devices. As a result, our internal review focuses, in part, on the regulators' concerns. We are working closely with the regulators to enhance our emissions systems to improve the effectiveness of all of our pick-up truck applications and to fully address the regulators' requirements. Based on discussions with the regulators, we have developed a new calibration for the engines in model year 2019 RAM 2500 and 3500 trucks that has been included in all engines shipped since September 2019. During our ongoing discussions, the regulators turned their attention to other model years and other engines, most notably our pick-up truck applications for RAM 2500 and 3500 trucks for model years 2013 through 2018. Due to the continuing nature of our formal review, our ongoing cooperation with our regulators and the presence of many unknown facts and circumstances, we cannot predict the final outcome of this review and these regulatory processes, nor whether, or the extent to which, they could have a material adverse impact on our results of operations and cash flows.

Guarantees and Commitments

Periodically, we enter into guarantee arrangements, including guarantees of non-U.S. distributor financings, residual value guarantees on equipment under operating leases and other miscellaneous guarantees of joint ventures or third-party obligations. At December 31, 2021, the maximum potential loss related to these guarantees was $39 million.

We have arrangements with certain suppliers that require us to purchase minimum volumes or be subject to monetary penalties. At December 31, 2021, if we were to stop purchasing from each of these suppliers, the aggregate amount of the penalty would be approximately $73 million. These arrangements enable us to secure supplies of critical components and IT services. We do not currently anticipate paying any penalties under these contracts.

We enter into physical forward contracts with suppliers of platinum and palladium to purchase certain volumes of the commodities at contractually stated prices for various periods, which generally fall within two years. At December 31, 2021, the total commitments under these contracts were $101 million. These arrangements enable us to guarantee the prices of these commodities, which otherwise are subject to market volatility.

We have guarantees with certain customers that require us to satisfactorily honor contractual or regulatory obligations, or compensate for monetary losses related to nonperformance. These performance bonds and other performance-related guarantees were $103 million at December 31, 2021.

Indemnifications

Periodically, we enter into various contractual arrangements where we agree to indemnify a third-party against certain types of losses. Common types of indemnities include:

- product liability and license, patent or trademark indemnifications;
- asset sale agreements where we agree to indemnify the purchaser against future environmental exposures related to the asset sold; and
- any contractual agreement where we agree to indemnify the counterparty for losses suffered as a result of a misrepresentation in the contract.

We regularly evaluate the probability of having to incur costs associated with these indemnities and accrue for expected losses that are probable. Because the indemnifications are not related to specified known liabilities and due to their uncertain nature, we are unable to estimate the maximum amount of the potential loss associated with these indemnifications.

NOTE 15. CUMMINS INC. SHAREHOLDERS' EQUITY

Preferred and Preference Stock

We are authorized to issue one million shares of zero par value preferred and one million shares of preference stock with preferred shares being senior to preference shares. We can determine the number of shares of each series, and the rights, preferences and limitations of each series. At December 31, 2021 and 2020, there was no preferred or preference stock outstanding.

Common Stock

Changes in shares of common stock, treasury stock and common stock held in trust for employee benefit plans were as follows:

In millions	Common Stock	Treasury Stock	Common Stock Held in Trust
Balance at December 31, 2018	222.4	64.4	0.4
Shares acquired	—	8.1	—
Shares issued	—	(0.8)	(0.2)
Balance at December 31, 2019	222.4	71.7	0.2
Shares acquired	—	3.9	—
Shares issued	—	(0.8)	(0.2)
Balance at December 31, 2020	222.4	74.8	—
Shares acquired	—	**5.7**	—
Shares issued	**0.1**	**(0.5)**	—
Balance at December 31, 2021	**222.5**	**80.0**	—

Treasury Stock

Shares of common stock repurchased by us are recorded at cost as treasury stock and result in a reduction of shareholders' equity in our *Consolidated Balance Sheets*. Treasury shares may be reissued as part of our stock-based compensation programs. When shares are reissued, we use the weighted-average cost method for determining cost. The gains between the cost of the shares and the issuance price are added to additional paid-in-capital. The losses are deducted from additional paid-in capital to the extent of the gains. Thereafter, the losses are deducted from retained earnings. Treasury stock activity for the three-year period ended December 31, 2021, consisting of shares issued and repurchased is presented in our *Consolidated Statements of Changes in Equity*.

In December 2021, the Board authorized the acquisition of up to $2.0 billion of additional common stock upon completion of the 2019 repurchase plan. In December 2019, the Board authorized the acquisition of up to $2.0 billion of additional common stock upon completion of the 2018 repurchase plan.For the year ended December 31, 2021, we made the following purchases under the stock repurchase program:

In millions (except per share amounts) For each quarter ended	Shares Purchased	Average Cost Per Share	Total Cost of Repurchases	Remaining Authorized Capacity [(1)]
April 4	1.7	$ 247.35	$ 418	$ 1,576
July 4	2.7	252.66	672	904
October 3	0.6	231.57	138	766
December 31	0.7	222.14	174	2,592
Total	5.7	244.73	$ 1,402	

[(1)] The remaining $ 592 million authorized capacity under the 2019 plan was calculated based on the cost to purchase the shares, but excludes commission expenses in accordance with the authorized plan.

We repurchased $1,402 million, $641 million and $1,271 million of our common stock in the years ended December 31, 2021, 2020 and 2019, respectively.

Dividends

Total dividends paid to common shareholders in 2021, 2020 and 2019 were $809 million, $782 million and $761 million, respectively. Declaration and payment of dividends in the future depends upon our income and liquidity position, among other factors, and is subject to declaration by the Board, who meet quarterly to consider our dividend payment. We expect to fund dividend payments with cash from operations.

In July 2021, the Board authorized an increase to our quarterly dividend of7.4 percent from $1.35 per share to $1.45 per share. In October 2020, the Board authorized a 3.0 percent increase to our quarterly cash dividend on our common stock from $1.311 per share to $1.35 per share. In July 2019, the Board approved a 15.0 percent increase to our quarterly dividend on our common stock from $1.14 per share to $1.311 per share. Cash dividends per share paid to common shareholders for the last three years were as follows:

	Quarterly Dividends		
	2021	**2020**	**2019**
First quarter	**$ 1.35**	$ 1.311	$ 1.14
Second quarter	**1.35**	1.311	1.14
Third quarter	**1.45**	1.311	1.311
Fourth quarter	**1.45**	1.35	1.311
Total	**$ 5.60**	$ 5.28	$ 4.90

NOTE 16. ACCUMULATED OTHER COMPREHENSIVE LOSS

Following are the changes in accumulated other comprehensive income (loss) by component:

In millions	Change in pensions and other postretirement defined benefit plans	Foreign currency translation adjustment	Unrealized gain (loss) on derivatives	Total attributable to Cummins Inc.	Noncontrolling interests	Total
Balance at December 31, 2018	$ (671)	$ (1,138)	$ 2	$ (1,807)		
Other comprehensive income before reclassifications						
Before-tax amount	(106)	(153)	(12)	(271)	$ (5)	$ (276)
Tax benefit	16	6	5	27	—	27
After-tax amount	(90)	(147)	(7)	(244)	(5)	(249)
Amounts reclassified from accumulated other comprehensive income[1]	27	—	(4)	23	—	23
Net current period other comprehensive loss	(63)	(147)	(11)	(221)	$ (5)	$ (226)
Balance at December 31, 2019	$ (734)	$ (1,285)	$ (9)	$ (2,028)		
Other comprehensive income before reclassifications						
Before-tax amount	(92)	73	(41)	(60)	$ (10)	$ (70)
Tax benefit	26	8	9	43	—	43
After-tax amount	(66)	81	(32)	(17)	(10)	(27)
Amounts reclassified from accumulated other comprehensive income[1]	65	—	(2)	63	—	63
Net current period other comprehensive (loss) income	(1)	81	(34)	46	$ (10)	$ 36
Balance at December 31, 2020	$ (735)	$ (1,204)	$ (43)	$ (1,982)		
Other comprehensive income before reclassifications						
Before-tax amount	**425**	**(5)**	**38**	**458**	**$ (5)**	**$ 453**
Tax (expense) benefit	**(103)**	**1**	**(12)**	**(114)**	**—**	**(114)**
After-tax amount	**322**	**(4)**	**26**	**344**	**(5)**	**339**
Amounts reclassified from accumulated other comprehensive income[1]	**67**	**—**	**—**	**67**	**—**	**67**
Net current period other comprehensive income (loss)	**389**	**(4)**	**26**	**411**	**$ (5)**	**$ 406**
Balance at December 31, 2021	**$ (346)**	**$ (1,208)**	**$ (17)**	**$ (1,571)**		

[1] Amounts are net of tax. Reclassifications out of accumulated other comprehensive income (loss) and the related tax effects are immaterial for separate disclosure.

NOTE 17. NONCONTROLLING INTERESTS

Noncontrolling interests in the equity of consolidated subsidiaries were as follows:

	December 31,	
In millions	2021	2020
Eaton Cummins Automated Transmission Technologies	$ **518**	$ 538
Cummins India Ltd.	**347**	319
Hydrogenics Corporation [1]	**38**	50
Other	**24**	20
Total	$ **927**	$ 927

[1] See Note 20, "ACQUISITION," for additional information.

NOTE 18. STOCK INCENTIVE AND STOCK OPTION PLANS

Our stock incentive plan (the Plan) allows for granting of up to 8.5 million total shares of equity awards to executives, employees and non-employee directors. Awards available for grant under the Plan include, but are not limited to, stock options, stock appreciation rights, performance shares and other stock awards. Shares issued under the Plan may be newly issued shares or reissued treasury shares.

Stock options are generally granted with a strike price equal to the fair market value of the stock on the date of grant and a life of 10 years. Stock options granted have a three-year vesting period. The strike price may be higher than the fair value of the stock on the date of the grant, but cannot be lower. Compensation expense is recorded on a straight-line basis over the vesting period beginning on the grant date. The compensation expense is based on the fair value of each option grant using the Black-Scholes option pricing model. Options granted to employees eligible for retirement under our retirement plan are fully expensed at the grant date.

Stock options are also awarded through the Key Employee Stock Investment Plan (KESIP) which allows certain employees, other than officers, to purchase shares of common stock on an installment basis up to an established credit limit. For every block of 100 KESIP shares purchased by the employee 50 stock options are granted. The options granted through the KESIP program are considered awards under the Plan and are vested immediately. Compensation expense for stock options granted through the KESIP program is recorded based on the fair value of each option grant using the Black-Scholes option pricing model.

Performance shares are granted as target awards and are earned based on certain measures of our operating performance. A payout factor has been established ranging from 0 to 200 percent of the target award based on our actual performance during the three-year performance period. The fair value of the award is equal to the average market price, adjusted for the present value of dividends over the vesting period, of our stock on the grant date. Compensation expense is recorded ratably over the period beginning on the grant date until the shares become unrestricted and is based on the amount of the award that is expected to be earned under the plan formula, adjusted each reporting period based on current information.

Restricted common stock is awarded from time to time at no cost to certain employees. Most awards are entitled to cash dividends and voting rights. Restrictions limit the sale or transfer of the shares during a defined period. Generally, one-third of the shares become vested and free from restrictions after two years and one-third of the shares issued become vested and free from restrictions each year thereafter on the anniversary of the grant date, provided the participant remains an employee. The fair value of the award is equal to the average market price of our stock on the grant date. Compensation expense is determined at the grant date and is recognized over the restriction period on a straight-line basis.

Employee compensation expense (net of estimated forfeitures) related to our share-based plans for the years ended December 31, 2021, 2020 and 2019, was approximately $36 million, $30 million and $48 million, respectively. In addition, non-employee director share-based compensation expense for the years ended December 31, 2021, 2020 and 2019, was approximately $1 million, $1 million and $1 million, respectively. Shares granted to non-employee directors vest immediately and have no restrictions or performance conditions. The excess tax benefit associated with our employee share-based plans for the years ended December 31, 2021, 2020 and 2019, was $9 million, $4 million and $4 million, respectively. The total unrecognized compensation expense (net of estimated forfeitures) related to nonvested awards for our employee share-based plans was approximately $55 million at December 31, 2021 and is expected to be recognized over a weighted-average period of approximately two years.

The table below summarizes the employee share-based activity in the Plan:

	Options		Weighted-average Exercise Price	Weighted-average Remaining Contractual Life (in years)		Aggregate Intrinsic Value (in millions)
Balance at December 31, 2018	3,243,662	$	130.55			
Granted	710,120		163.42			
Exercised	(652,980)		116.76			
Forfeited	(63,232)		139.86			
Balance at December 31, 2019	3,237,570		140.36			
Granted	632,080		142.81			
Exercised	(660,786)		131.25			
Forfeited	(33,334)		150.83			
Balance at December 31, 2020	3,175,530		142.63			
Granted	**16,550**		**232.44**			
Exercised	**(400,154)**		**138.93**			
Forfeited	**(48,828)**		**153.72**			
Balance at December 31, 2021	**2,743,098**	**$**	**143.51**	**5.8**	**$**	**205**
Exercisable, December 31, 2019	1,665,710	$	123.55	4.8	$	92
Exercisable, December 31, 2020	1,589,015	$	130.28	4.6	$	151
Exercisable, December 31, 2021	**1,629,588**	**$**	**136.74**	**4.4**	**$**	**133**

The weighted-average grant date fair value of options granted during the years ended December 31, 2021, 2020 and 2019, was $46.03, $25.40 and $31.04, respectively. The total intrinsic value of options exercised during the years ended December 31, 2021, 2020 and 2019, was approximately $41 million, $40 million and $35 million, respectively.

The weighted-average grant date fair value of performance and restricted shares was as follows:

	Performance Shares			Restricted Shares		
Nonvested	Shares		Weighted-average Fair Value	Shares		Weighted-average Fair Value
Balance at December 31, 2018	410,350	$	126.36	5,393	$	117.68
Granted	185,377		141.01	—		—
Vested	(176,613)		98.28	(2,696)		117.68
Forfeited	(23,183)		145.26	—		—
Balance at December 31, 2019	395,931		144.64	2,697		117.68
Granted	260,480		132.57	3,704		165.04
Vested	(268,773)		138.27	(2,697)		117.68
Forfeited	(10,684)		144.22	—		—
Balance at December 31, 2020	376,954		140.85	3,704		165.04
Granted	**217,684**		**234.22**	**26,224**		**265.41**
Vested	**(131,744)**		**146.55**	**—**		**—**
Forfeited	**(22,745)**		**171.91**	**—**		**—**
Balance at December 31, 2021	**440,149**	**$**	**183.72**	**29,928**	**$**	**252.99**

The total vesting date fair value of performance shares vested during the years ended December 31, 2021, 2020 and 2019, was $35 million, $41 million and $27 million, respectively. There were no restricted shares vested for the year ended December 31, 2021. The total fair value of restricted shares vested was less than $1 million and less than $1 million for the years ended December 31, 2020 and 2019, respectively.

The fair value of each option grant was estimated on the grant date using the Black-Scholes option pricing model with the following assumptions:

	2021	2020	2019
Expected life (years)	**6**	6	6
Risk-free interest rate	**1.15 %**	0.62 %	2.41 %
Expected volatility	**28.68 %**	27.05 %	23.79 %
Dividend yield	**2.95 %**	2.88 %	2.68 %

Expected life—The expected life of employee stock options represents the weighted-average period the stock options are expected to remain outstanding based upon our historical data.

Risk-free interest rate—The risk-free interest rate assumption is based upon the observed U.S. treasury security rate appropriate for the expected life of our employee stock options.

Expected volatility—The expected volatility assumption is based upon the weighted-average historical daily price changes of our common stock over the most recent period equal to the expected option life of the grant, adjusted for activity which is not expected to occur in the future.

Dividend yield—The dividend yield assumption is based on our history and expectation of dividend payouts.

NOTE 19. EARNINGS PER COMMON SHARE ATTRIBUTABLE TO CUMMINS INC.

We calculate basic earnings per share (EPS) of common stock by dividing net income attributable to Cummins Inc. by the weighted-average number of common shares outstanding for the period. The calculation of diluted EPS assumes the issuance of common stock for all potentially dilutive share equivalents outstanding. We excluded shares of common stock held in the Employee Benefits Trust (EBT) from the calculation of the weighted-average common shares outstanding until those shares are distributed from the EBT to the Retirement Savings Plan. The EBT was fully depleted at December 31, 2021. Following are the computations for basic and diluted earnings per share:

	Years ended December 31,		
In millions, except per share amounts	**2021**	**2020**	**2019**
Net income attributable to Cummins Inc.	**$ 2,131**	$ 1,789	$ 2,260
Weighted-average common shares outstanding			
Basic	**144.6**	148.2	155.4
Dilutive effect of stock compensation awards	**1.3**	0.8	0.7
Diluted	**145.9**	149.0	156.1
Earnings per common share attributable to Cummins Inc.			
Basic	**$ 14.74**	$ 12.07	$ 14.54
Diluted	**14.61**	12.01	14.48

The weighted-average diluted common shares outstanding exclude the anti-dilutive effect of certain stock options.The options excluded from diluted earnings per share were as follows:

	Years ended December 31,		
	2021	**2020**	**2019**
Options excluded	**6,463**	645,334	473,845

NOTE 20. ACQUISITION

The acquisition for the year ended December 31, 2019, was as follows:

Entity Acquired (Dollars in millions)	Date of Acquisition	Percent Interest Acquired	Payments to Former Owners	Acquisition Related Debt Retirements	Total Purchase Consideration[(1)]	Goodwill Recognized	Intangibles Recognized[(2)]	Net Sales Previous Fiscal Year Ended
Hydrogenics Corporation	9/09/19	81%	$ 235	$ —	$ 235	$ 161	$ 161	$ 34

[(1)] All results from the acquired entity were included in segment results subsequent to the acquisition date, and the acquisition was accounted for as a business combination and included in the New Power segment on the date of acquisition.

[(2)] Intangible assets acquired in the business combination were mostly customer and technology related, the majority of which will be amortized over a period of up to 20 years from the date of the acquisition.

No material acquisitions occurred during the years ended December 31, 2021 or 2020.

NOTE 21. RESTRUCTURING ACTIONS

We executed restructuring actions in the form of voluntary and involuntary employee separation programs in the fourth quarter of 2019. These actions were in response to the continued deterioration in our global markets in the second half of 2019, as well as expected reductions in orders in most U.S. and international markets in 2020. We reduced our worldwide workforce by approximately 2,300 employees. We incurred a charge of $119 million ($90 million after-tax) in the fourth quarter of 2019 for these actions. The voluntary actions were completed by December 31, 2019 and the involuntary actions were completed by June 28, 2020.

NOTE 22. OPERATING SEGMENTS

Operating segments under GAAP are defined as components of an enterprise about which separate financial information is available that is evaluated regularly by the Chief Operating Decision Maker (CODM), or decision-making group, in deciding how to allocate resources and in assessing performance. Our CODM is the President and Chief Operating Officer.

Our reportable operating segments consist of Engine, Distribution, Components, Power Systems and New Power. This reporting structure is organized according to the products and markets each segment serves. The Engine segment produces engines (15 liters and smaller) and associated parts for sale to customers in on-highway and various off-highway markets. Our engines are used in trucks of all sizes, buses and recreational vehicles, as well as in various industrial applications, including construction, agriculture, power generation systems and other off-highway applications. The Distribution segment includes wholly-owned and partially-owned distributorships engaged in wholesaling engines, generator sets and service parts, as well as performing service and repair activities on our products and maintaining relationships with various OEMs throughout the world. The Components segment sells filtration products, aftertreatment systems, turbochargers, electronics, fuel systems and automated transmissions. The Power Systems segment is an integrated power provider, which designs, manufactures and sells engines (16 liters and larger) for industrial applications (including mining, oil and gas, marine and rail), standby and prime power generator sets, alternators and other power components. The New Power segment designs, manufactures, sells and supports hydrogen production solutions as well as electrified power systems ranging from fully electric to hybrid along with innovative components and subsystems, including battery and fuel cell technologies. The New Power segment is currently in the development phase with a primary focus on research and development activities for our power systems, components and subsystems. We continue to serve all our markets as they adopt electrification and alternative power technologies, meeting the needs of our OEM partners and end customers.

We use segment earnings or losses before interest expense, income taxes, depreciation and amortization and noncontrolling interests (EBITDA) as the primary basis for the CODM to evaluate the performance of each of our reportable operating segments. We believe EBITDA is a useful measure of our operating performance as it assists investors and debt holders in comparing our performance on a consistent basis without regard to financing methods, capital structure, income taxes or depreciation and amortization methods, which can vary significantly depending upon many factors. Segment amounts exclude certain expenses not specifically identifiable to segments.

The accounting policies of our operating segments are the same as those applied in our *Consolidated Financial Statements*. We prepared the financial results of our operating segments on a basis that is consistent with the manner in which we internally disaggregate financial information to assist in making internal operating decisions. We allocate certain common costs and expenses, primarily corporate functions, among segments differently than we would for stand-alone financial information prepared in accordance with GAAP. These include certain costs and expenses of shared services, such as information technology, human resources, legal, finance and supply chain management. We do not allocate gains or losses of corporate owned life insurance to individual segments. EBITDA may not be consistent with measures used by other companies.

Summarized financial information regarding our reportable operating segments at December 31, is shown in the table below:

In millions	Engine	Distribution	Components	Power Systems	New Power	Total Segments
2021						
External sales	**$ 7,589**	**$ 7,742**	**$ 5,932**	**$ 2,650**	**$ 108**	**$ 24,021**
Intersegment sales	**2,365**	**30**	**1,733**	**1,765**	**8**	**5,901**
Total sales	**9,954**	**7,772**	**7,665**	**4,415**	**116**	**29,922**
Research, development and engineering expenses	**399**	**48**	**307**	**234**	**102**	**1,090**
Equity, royalty and interest income (loss) from investees	**340**	**63**	**50**	**56**	**(3)**	**506**
Interest income	**8**	**7**	**5**	**5**	**—**	**25**
Segment EBITDA	**1,411**	**731**	**1,180**	**496**	**(223)**	**3,595**
Depreciation and amortization [(1)]	**205**	**116**	**183**	**131**	**24**	**659**
Net assets	**1,554**	**2,294**	**2,938**	**2,251**	**602**	**9,639**
Investments and advances to equity investees	**742**	**329**	**254**	**164**	**49**	**1,538**
Capital expenditures	**341**	**92**	**184**	**80**	**37**	**734**
2020						
External sales	$ 5,925	$ 7,110	$ 4,650	$ 2,055	$ 71	$ 19,811
Intersegment sales	2,097	26	1,374	1,576	1	5,074
Total sales	8,022	7,136	6,024	3,631	72	24,885
Research, development and engineering expenses	290	31	264	212	109	906
Equity, royalty and interest income (loss) from investees	312	62	61	21	(4)	452
Interest income	9	4	4	4	—	21
Segment EBITDA	1,235	665	961	343	(172)	3,032
Depreciation and amortization [(1)]	208	122	192	130	18	670
Net assets	1,306	2,444	2,878	2,134	504	9,266
Investments and advances to equity investees	681	313	215	200	32	1,441
Capital expenditures	202	89	140	79	18	528

(Table continued on next page)

In millions	Engine	Distribution	Components	Power Systems	New Power	Total Segments
2019						
External sales	$ 7,570	$ 8,040	$ 5,253	$ 2,670	$ 38	$ 23,571
Intersegment sales	2,486	31	1,661	1,790	—	5,968
Total sales	10,056	8,071	6,914	4,460	38	29,539
Research, development and engineering expenses	337	28	300	230	106	1,001
Equity, royalty and interest income from investees	200	52	40	38	—	330
Interest income	15	15	8	8	—	46
Segment EBITDA (excluding restructuring actions)	1,472	693	1,117	524	(148)	3,658
Restructuring actions [(2)]	18	37	20	12	1	88
Segment EBITDA	1,454	656	1,097	512	(149)	3,570
Depreciation and amortization [(1)]	202	115	222	118	12	669
Capital expenditures	240	136	191	107	26	700

[(1)] Depreciation and amortization, as shown on a segment basis, excludes the amortization of debt discount and deferred costs included in the *Consolidated Statements of Net Income* as "Interest expense." The amortization of debt discount and deferred costs were $ 3 million, $3 million and $ 3 million for the years ended 2021, 2020 and 2019, respectively. A portion of depreciation expense is included in "Research, development and engineering expense."

[(2)] See Note 21 "RESTRUCTURING ACTIONS," for additional information.

A reconciliation of our total segment sales to total net sales in the *Consolidated Statements of Net Income* was as follows:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
Total segment sales	**$ 29,922**	$ 24,885	$ 29,539
Elimination of intersegment sales	**(5,901)**	(5,074)	(5,968)
Total net sales	**$ 24,021**	$ 19,811	$ 23,571

A reconciliation of our segment information to the corresponding amounts in the *Consolidated Statements of Net Income* is shown in the table below:

	Years ended December 31,		
In millions	**2021**	**2020**	**2019**
TOTAL SEGMENT EBITDA	**$ 3,595**	$ 3,032	$ 3,570
Intersegment elimination	**(74)**	76	42
Less:			
Interest expense	**111**	100	109
Depreciation and amortization	**659**	670	669
INCOME BEFORE INCOME TAXES	**2,751**	2,338	2,834
Less: Income tax expense	**587**	527	566
CONSOLIDATED NET INCOME	**2,164**	1,811	2,268
Less: Net income attributable to noncontrolling interests	**33**	22	8
NET INCOME ATTRIBUTABLE TO CUMMINS INC.	**$ 2,131**	$ 1,789	$ 2,260

A reconciliation of our segment net assets to the corresponding amounts in the *Consolidated Balance Sheets* is shown in the table below:

	December 31,	
In millions	**2021**	**2020**
Net assets for operating segments	**$ 9,639**	$ 9,266
Cash, cash equivalents and marketable securities	**3,187**	3,862
Net liabilities deducted in arriving at net assets[1]	**9,486**	8,947
Pension and OPEB adjustments excluded from net assets	**966**	67
Deferred tax assets not allocated to segments	**428**	479
Deferred debt costs not allocated to segments	**4**	3
Total assets	**$ 23,710**	$ 22,624

[1] Liabilities deducted in arriving at net assets include certain accounts payable, accrued expenses, long-term liabilities and other items.

See Note 2, "REVENUE FROM CONTRACTS WITH CUSTOMERS," for segment net sales by geographic area.

Long-lived assets include property, plant and equipment, net of depreciation, investments and advances to equity investees and other assets, excluding deferred tax assets, refundable taxes and deferred debt expenses. Long-lived segment assets by geographic area were as follows:

	December 31,	
In millions	**2021**	**2020**
United States	**$ 3,978**	$ 3,776
China	**1,136**	1,010
India	**573**	595
United Kingdom	**384**	370
Netherlands	**314**	295
Mexico	**195**	187
Canada	**163**	149
Other international countries	**554**	545
Total long-lived assets	**$ 7,297**	$ 6,927

Our largest customer is PACCAR Inc. Worldwide sales to this customer were approximately $3.6 billion, $2.9 billion and $3.9 billion for the years ended December 31, 2021, 2020 and 2019, representing 15 percent, 15 percent and 17 percent, respectively, of our consolidated net sales. No other customer accounted for more than 10 percent of consolidated net sales.

ITEM 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

ITEM 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As of the end of the period covered by this Annual Report on Form 10-K, our management evaluated, with the participation of our Chief Executive Officer and Chief Financial Officer, the effectiveness of the design and operation of our disclosure controls and procedures as defined in Exchange Act Rules 13a-15(e) and 15d-15(e). Based upon that evaluation, our Chief Executive Officer and our Chief Financial Officer concluded that our disclosure controls and procedures were effective as of the end of the period covered by this Annual Report on Form 10-K.

Changes in Internal Control over Financial Reporting

There has been no change in our internal control over financial reporting during the quarter ended December 31, 2021, that materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Management's Report on Internal Control Over Financial Reporting

The information required by Item 9A relating to Management's Annual Report on Internal Control Over Financial Reporting and Attestation Report of the Registered Public Accounting Firm is incorporated herein by reference to the information set forth under the captions "Management's Report on Internal Control Over Financial Reporting" and "Report of Independent Registered Public Accounting Firm," respectively, under Item 8.

ITEM 9B. Other Information

None.

ITEM 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not Applicable.

PART III

ITEM 10. Directors, Executive Officers and Corporate Governance

The information required by Item 10 is incorporated by reference to the relevant information under the captions "Corporate Governance," "Election of Directors" in our 2022 Proxy Statement, which will be filed within 120 days after the end of 2021. Information regarding our executive officers may be found in Part 1 of this annual report under the caption "Information About Our Executive Officers." Except as otherwise specifically incorporated by reference, our Proxy Statement is not deemed to be filed as part of this annual report.

ITEM 11. Executive Compensation

The information required by Item 11 is incorporated by reference to the relevant information under the caption "Executive Compensation" in our 2022 Proxy Statement, which will be filed within 120 days after the end of 2021.

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

Information concerning our equity compensation plans at December 31, 2021, was as follows:

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights(1)	Weighted-average exercise price of outstanding options, warrants and rights(2)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in the first column)
Equity compensation plans approved by security holders	3,213,175	$ 143.51	5,309,472

(1) The number is comprised of 2,743,098 stock options, 440,149 performance shares and 29,928 restricted shares. See Note 18, "STOCK INCENTIVE AND STOCK OPTION PLANS," to the *Consolidated Financial Statements* for a description of how options and shares are awarded.

(2) The weighted-average exercise price relates only to the 2,743,098 stock options. Performance and restricted shares do not have an exercise price and, therefore, are not included in this calculation.

We have no equity compensation plans not approved by security holders.

The remaining information required by Item 12 is incorporated by reference to the relevant information under the caption "Stock Ownership of Directors, Management and Others" in our 2022 Proxy Statement, which will be filed within 120 days after the end of 2021.

ITEM 13. Certain Relationships, Related Transactions and Director Independence

The information required by Item 13 is incorporated by reference to the relevant information under the captions "Corporate Governance" and "Other Information-Related Party Transactions" in our 2022 Proxy Statement, which will be filed within 120 days after the end of 2021.

ITEM 14. Principal Accounting Fees and Services

The information required by Item 14 is incorporated by reference to the relevant information under the caption "Selection of Independent Public Accountants" in our 2022 Proxy Statement, which will be filed within 120 days after the end of 2021.

PART IV

ITEM 15. Exhibits, Financial Statement Schedules

(a) The following *Consolidated Financial Statements* and schedules filed as part of this report can be found in Item 8 "Financial Statements and Supplementary Data":

- **Management's Report to Shareholders**
- **Report of Independent Registered Public Accounting Firm**
- ***Consolidated Statements of Net Income* for the years ended December 31, 2021, 2020 and 2019**
- ***Consolidated Statements of Comprehensive Income* for the years ended December 31, 2021, 2020 and 2019**
- ***Consolidated Balance Sheets* at December 31, 2021 and 2020**
- ***Consolidated Statements of Cash Flows* for the years ended December 31, 2021, 2020 and 2019**
- ***Consolidated Statements of Changes in Equity* for the years ended December 31, 2021, 2020 and 2019**
- ***Notes to the Consolidated Financial Statements***

(b) Financial Statement Schedules

Separate financial statement schedules were omitted because such information was inapplicable or was included in the financial statements or notes described above.

(c) The exhibits listed in the following Exhibit Index are filed as part of this Annual Report on Form 10-K.

CUMMINS INC.

Exhibit No.	Description of Exhibit
3 (a)	Restated Articles of Incorporation, as amended and restated, effective as of May 8, 2018 (incorporated by reference to Exhibit 3.2 to the Current Report on Form 8-K filed with the Securities and Exchange Commission on May 9, 2018 (File No. 001-04949)).
3 (b)	By-Laws, as amended and restated, effective as of February 12, 2019 (incorporated by reference to Exhibit 3.2 to the Current Report on Form 8-K filed by Cummins Inc. with the Securities and Exchange Commission on February 13, 2019 (File No. 001-04949)).
4 (a)	Indenture, dated as of September 16, 2013, by and between Cummins Inc. and U.S. Bank National Association (incorporated by reference to Exhibit 4.3 to the Registration Statement on Form S-3 filed with the Securities and Exchange Commission on September 16, 2013 (Registration Statement No. 333-191189)).
4 (b)	First Supplemental Indenture, dated as of September 24, 2013, between Cummins Inc. and U.S. Bank National Association (incorporated by reference to Exhibit 4.1 of the Current Report on 8-K, filed by Cummins Inc. with the Securities and Exchange Commission on September 24, 2013 (File No. 001-04949)).
4 (c)	Second Supplemental Indenture, dated as of September 24, 2013, between Cummins Inc. and U.S. Bank National Association (incorporated by reference to Exhibit 4.2 of the Current Report on 8-K, filed by Cummins Inc. with the Securities and Exchange Commission on September 24, 2013 (File No. 001-04949)).
4 (d)	Third Supplemental Indenture, dated as of August 24, 2020, between Cummins Inc. and U.S. Bank National Association (incorporated by reference to Exhibit 4.2 to the Current Report on Form 8-K filed by Cummins Inc. with the Securities and Exchange Commission on August 24, 2020 (File No. 001-04949)).
4 (e)	Fourth Supplemental Indenture, dated as of August 24, 2020, between Cummins Inc. and U.S. Bank National Association (incorporated by reference to Exhibit 4.3 to the Current Report on Form 8-K filed by Cummins Inc. with the Securities and Exchange Commission on August 24, 2020 (File No. 001-04949)).
4 (f)	Fifth Supplemental Indenture, dated as of August 24, 2020, between Cummins Inc. and U.S. Bank National Association (incorporated by reference to Exhibit 4.4 to the Current Report on Form 8-K filed by Cummins Inc. with the Securities and Exchange Commission on August 24, 2020 (File No. 001-04949)).
4 (g)	Description of Capital Stock (incorporated by reference to Exhibit 4(d) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2019 (File No. 001-04949)).
10 (a)#	2003 Stock Incentive Plan, as amended (incorporated by reference to Exhibit 10(a) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-04949)).
10 (b)#	Target Bonus Plan (incorporated by reference to Exhibit 10(b) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-04949)).
10 (c)#	Amendment to the Cummins Inc. Deferred Compensation Plan (incorporated by reference to Exhibit 10(c) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2018 (File No. 001-04949)).
10 (d)#	Deferred Compensation Plan, as amended and restated February 15, 2021 (incorporated by reference to Exhibit 10(a) to Cummins Inc.'s Quarterly Report on Form 10-Q for the quarter ended April 4, 2021 (File No. 001-04949)).
10 (e)#	Supplemental Life Insurance and Deferred Income Plan, as amended and restated effective as of December 10, 2018 (incorporated by reference to Exhibit 10(d) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2018 (File No. 001-04949)).
10 (f)#	Deferred Compensation Plan for Non-Employee Directors, as amended and restated February 15, 2021 (incorporated by reference to Exhibit 10(b) to Cummins Inc.'s Quarterly Report on Form 10-Q for the quarter ended April 4, 2021 (File No. 001-04949)).
10 (g)#	Excess Benefit Retirement Plan, as amended (incorporated by reference to Exhibit 10(g) to Cummins Inc.'s Quarterly Report on Form 10-Q for the quarter ended September 28, 2014 (File No. 001-04949)).
10 (h)#	Cummins Inc. Employee Stock Purchase Plan, as amended (incorporated by reference to Exhibit 10(i) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2019 (File No. 001-04949)).
10 (i)#	Longer Term Performance Plan (incorporated by reference to Exhibit 10(i) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-04949)).
10 (j)#	2006 Executive Retention Plan, as amended (incorporated by reference to Exhibit 10(j) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2011 (File No. 001-04949)).
10 (k)#	Senior Executive Target Bonus Plan (incorporated by reference to Exhibit 10(k) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-04949)).
10 (l)#	Senior Executive Longer Term Performance Plan (incorporated by reference to Exhibit 10(l) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-04949)).
10 (m)#	Form of Stock Option Agreement under the 2003 Stock Incentive Plan (incorporated by reference to Exhibit 10(m) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2009) (File No. 001-04949).
10 (n)#	Form of Long-Term Grant Notice under the 2012 Omnibus Incentive Plan (incorporated by reference to Exhibit 10(b) to Cummins Inc.'s Quarterly Report on Form 10-Q for the quarter ended March 29, 2020 (File No. 001-04949)).
10 (o)#	2012 Omnibus Incentive Plan, as amended and restated (incorporated by reference to Exhibit 10 to Cummins Inc.'s Quarterly Report on Form 10-Q for the quarter ended July 1, 2018 (File No. 001-04949)).

10 (p)#	Form of Stock Option Agreement under the 2012 Omnibus Incentive Plan (incorporated by reference to Exhibit 10(q) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2020 (File No. 001-04949)).
10 (q)#	Key Employee Stock Investment Plan (incorporated by reference to Exhibit 10(r) to Cummins Inc.'s Annual Report on Form 10-K for the year ended December 31, 2020 (File No. 001-04949)).
10 (r)#	Third Amended and Restated 364-Day Credit Agreement, dated as of August 18, 2021, by and among Cummins Inc., the subsidiary borrowers referred to therein, the Lenders and Agents party thereto and JPMorgan Chase Bank, N.A., as Administrative Agent.(incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K filed by Cummins Inc. with the Securities and Exchange Commission on August 18, 2021 (File No. 001-04949)).
10 (s)#	Amended and Restated Credit Agreement, dated as of August 18, 2021, by and among Cummins Inc., the subsidiary borrowers referred to therein, the Lenders and Agents party thereto and JPMorgan Chase Bank, N.A., as Administrative Agent. (incorporated by reference to Exhibit 10.2 to the Current Report on Form 8-K filed by Cummins Inc. with the Securities and Exchange Commission on August 18, 2021 (File No. 001-04949)).
10 (t)#	Amendment No. 1 to Supplemental Life Insurance and Deferred Income Plan, effective as of July 14, 2020 (incorporated by reference to Exhibit 10.1 to Cummins Inc.'s Quarterly Report on Form 10-Q for the quarter ended September 27, 2020 (File No. 001-04949)).
21	Subsidiaries of the Registrant (filed herewith).
23	Consent of PricewaterhouseCoopers LLP (filed herewith).
24	Powers of Attorney (filed herewith).
31 (a)	Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith).
31 (b)	Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith).
32	Certifications Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (filed herewith).
101 .INS*	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101 .SCH*	Inline XBRL Taxonomy Extension Schema Document.
101 .CAL*	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101 .DEF*	Inline XBRL Taxonomy Extension Definition Linkbase Document.
101 .LAB*	Inline XBRL Taxonomy Extension Label Linkbase Document.
101 .PRE*	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).

A management contract or compensatory plan or arrangement.

* Filed with this annual report on Form 10-K are the following documents formatted in iXBRL (Inline Extensible Business Reporting Language): (i) the Consolidated Statements of Net Income for the years ended December 31, 2021, 2020 and 2019, (ii) the Consolidated Statements of Comprehensive Income for the years ended December 31, 2021, 2020 and 2019, (iii) the Consolidated Balance Sheets for the years ended December 31, 2021 and 2020, (iv) the Consolidated Statements of Cash Flows for the years ended December 31, 2021, 2020 and 2019, (v) the Consolidated Statements of Changes in Equity for the years ended December 31, 2021, 2020 and 2019 and (vi) Notes to the Consolidated Financial Statements.

ITEM 16. Form 10-K Summary (optional)

Not Applicable.

SIGNATURES

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

CUMMINS INC.

By:	/s/ MARK A. SMITH Mark A. Smith *Vice President and Chief Financial Officer* *(Principal Financial Officer)*	By:	/s/ CHRISTOPHER C. CLULOW Christopher C. Clulow *Vice President—Corporate Controller* *(Principal Accounting Officer)*

Date: February 8, 2022

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

Signatures	Title	Date
/s/ N. THOMAS LINEBARGER N. Thomas Linebarger	Chairman of the Board of Directors and Chief Executive Officer (Principal Executive Officer)	February 8, 2022
/s/ MARK A. SMITH Mark A. Smith	Vice President and Chief Financial Officer (Principal Financial Officer)	February 8, 2022
/s/ CHRISTOPHER C. CLULOW Christopher C. Clulow	Vice President—Corporate Controller (Principal Accounting Officer)	February 8, 2022
* Robert J. Bernhard	Director	February 8, 2022
* Franklin R. ChangDiaz	Director	February 8, 2022
* Bruno V. Di Leo Allen	Director	February 8, 2022
* Stephen B. Dobbs	Director	February 8, 2022
* Carla A. Harris	Director	February 8, 2022
* Robert K. Herdman	Director	February 8, 2022
* Alexis M. Herman	Director	February 8, 2022
* Thomas J. Lynch	Director	February 8, 2022
* William I. Miller	Director	February 8, 2022
* Georgia R. Nelson	Director	February 8, 2022
* Kimberly A. Nelson	Director	February 8, 2022
* Karen H. Quintos	Director	February 8, 2022

*By: /s/ MARK A. SMITH

Mark A. Smith
Attorney-in-fact

CUMMINS INC.

SUBSIDIARIES OF THE REGISTRANT

EXHIBIT 21

Entity Name	**Country or State of Organization**
Apollo FC Holdings Ltd.	British Colombia
Atlantis Holdco UK Limited	England
AVK Holdco UK Limited	United Kingdom
Centro de Fomento para Inclusión, S. de R.L. de C.V.	Mexico
Cherry Island Renewable Energy, LLC	Delaware
CMI 2020 Holdings LLC	Indiana
CMI Africa Holdings BV	The Netherlands
CMI Canada Financing Ltd.	United Kingdom
CMI Canada LP	Canada
CMI Foreign Holdings B.V.	The Netherlands
CMI Global Holdings B.V.	The Netherlands
CMI Global Partners B.V.	The Netherlands
CMI Group Holdings B.V.	The Netherlands
CMI International Finance Partner 2 LLC	Indiana
CMI International Finance Partner 5 LLC	Indiana
CMI Mexico LLC	Indiana
CMI Netherlands Holdings B.V.	The Netherlands
CMI PGI Holdings LLC	Indiana
CMI PGI International Holdings LLC	Indiana
CMI Turkish Holdings B.V.	The Netherlands
Consolidated Diesel Company	North Carolina
Consolidated Diesel of North Carolina Inc.	North Carolina
Consolidated Diesel, Inc.	Delaware
Cummins (China) Investment Co. Ltd.	China
Cummins Africa Middle East (Pty) Ltd.	South Africa
Cummins Afrique de l'Ouest	Senegal
Cummins Americas, Inc.	Indiana
Cummins Angola Lda.	Angola
Cummins Argentina-Servicios Mineros S.A.	Argentina
Cummins Asia Pacific Pte. Ltd.	Singapore
Cummins Battery Systems North America LLC	Indiana
Cummins Belgium N.V.	Belgium
Cummins BLR LLC	Belarus
Cummins Botswana (Pty.) Ltd.	Botswana
Cummins Brasil Ltda.	Brazil
Cummins Burkina Faso SARL	Burkina Faso
Cummins Canada ULC	Canada
Cummins Caribbean LLC	Puerto Rico
Cummins CDC Holding Inc.	Indiana
Cummins Centroamerica Holding S.de R.L.	Panama
Cummins Child Development Center, Inc.	Indiana
Cummins Chile SpA	Chile
Cummins Colombia S.A.S.	Colombia
Cummins Comercializadora S. de R.L. de C.V.	Mexico

CUMMINS INC.

SUBSIDIARIES OF THE REGISTRANT

Cummins Corporation	Indiana
Cummins Cote d'Ivoire SARL	Cote d'Ivoire
Cummins Czech Republic s.r.o.	Czech Republic
Cummins Deutschland GmbH	Germany
Cummins Diesel International Ltd.	Barbados
Cummins Distribution Holdco Inc.	Indiana
Cummins East Asia Research & Development Co. Ltd.	China
Cummins Electrified Power Europe Ltd.	Scotland
Cummins Electrified Power NA Inc.	Delaware
Cummins EMEA Holdings Limited	United Kingdom
Cummins Emission Solutions (China) Co., Ltd.	China
Cummins Emission Solutions Inc.	Indiana
Cummins Empresas Filantropicas	Mexico
Cummins Engine (Beijing) Co. Ltd.	China
Cummins Engine (Shanghai) Co. Ltd.	China
Cummins Engine (Shanghai) Trading & Services Co. Ltd.	China
Cummins Engine Holding Company, Inc.	Indiana
Cummins Engine IP, Inc.	Delaware
Cummins Engine Malaysia Sdn. Bhd.	Malaysia
Cummins Engine Venture Corporation	Indiana
Cummins Enterprise LLC	Indiana
Cummins Filtration (Shanghai) Co. Ltd.	China
Cummins Filtration GmbH	Germany
Cummins Filtration Inc.	Indiana
Cummins Filtration International Corp.	Indiana
Cummins Filtration International Corp. External Profit Company	South Africa
Cummins Filtration IP, Inc.	Delaware
Cummins Filtration Ltd.	Korea
Cummins Filtration SARL	France
Cummins Filtration Trading (Shanghai) Co., Ltd.	China
Cummins Filtros Ltda.	Brazil
Cummins Franchise Holdco LLC	Indiana
Cummins Fuel Systems (Wuhan) Co. Ltd.	China
Cummins Generator Technologies Americas Inc.	Pennsylvania
Cummins Generator Technologies (China) Co., Ltd.	China
Cummins Generator Technologies Germany GmbH	Germany
Cummins Generator Technologies India Private Ltd.	India
Cummins Generator Technologies Italy SRL	Italy
Cummins Generator Technologies Limited	United Kingdom
Cummins Generator Technologies Romania S.A.	Romania
Cummins Generator Technologies Singapore Pte Ltd.	Singapore
Cummins Ghana Limited	Ghana
Cummins Ghana Mining Limited	Ghana
Cummins Holland B.V.	The Netherlands
Cummins Hong Kong Ltd.	Hong Kong

CUMMINS INC.

SUBSIDIARIES OF THE REGISTRANT

Cummins Hydrogen Technology (Shanghai) Co. Ltd.	China
Cummins India Ltd.	India
Cummins Intellectual Property, Inc.	Delaware
Cummins International Finance LLC	Indiana
Cummins International Holdings Cooperatief U.A.	The Netherlands
Cummins Italia S.P.A.	Italy
Cummins Japan Ltd.	Japan
Cummins Korea Co. Ltd.	Korea
Cummins Ltd.	United Kingdom
Cummins Maroc SARL	Morocco
Cummins Middle East FZE	Dubai
Cummins Mining Services S. de R.L. de C.V.	Mexico
Cummins Mobility Services Inc.	Indiana
Cummins Mongolia Investment LLC	Mongolia
Cummins Motorenwerke Deutschland GmbH	Germany
Cummins Mozambique Ltda.	Mozambique
Cummins Namibia Engine Sales and Service PTY LTD	Namibia
Cummins Natural Gas Engines, Inc.	Delaware
Cummins New Power (Shanghai) Co. Ltd.	China
Cummins New Power S.L.	Spain
Cummins New Zealand Limited	New Zealand
Cummins Nigeria Ltd.	Nigeria
Cummins Norte de Colombia S.A.S.	Colombia
Cummins North Africa Regional Office SARL	Morocco
Cummins Norway AS	Norway
Cummins NV	Belgium
Cummins Patton Acquisition LLC	Delaware
Cummins PGI Holdings Ltd.	United Kingdom
Cummins Power Generation (China) Co., Ltd.	China
Cummins Power Generation (s) Pte. Ltd.	Singapore
Cummins Power Generation (U.K.) Limited	United Kingdom
Cummins Power Generation Deutschland GmbH	Germany
Cummins Power Generation Inc.	Delaware
Cummins Power Generation Limited	United Kingdom
Cummins PowerGen IP, Inc.	Delaware
Cummins Research and Technology India Private Ltd.	India
Cummins Romania Srl	Romania
Cummins S. de R.L. de C.V.	Mexico
Cummins Sales and Service Korea Co., Ltd.	Korea
Cummins Sales and Service Philippines Inc.	Philippines
Cummins Sales and Service Private Limited	India
Cummins Sales and Service Singapore Pte. Ltd.	Singapore
Cummins Sales and Service Sdn. Bhd.	Malaysia
Cummins Sinai ve Otomotiv Urunleri Sanayi ve Ticaret Limited Sirketi	Turkey
Cummins South Africa (Pty.) Ltd.	South Africa

CUMMINS INC.

SUBSIDIARIES OF THE REGISTRANT

Cummins Southern Plains LLC	Texas
Cummins South Pacific Pty. Ltd.	Australia
Cummins Spain, S.L.	Spain
Cummins Sweden AB	Sweden
Cummins Technologies India Private Limited	India
Cummins Turbo Technologies Limited	United Kingdom
Cummins Turkey Motor Güç Sistemleri Satış Servis Limited Şirketi	Turkey
Cummins U.K. Holdings Ltd.	United Kingdom
Cummins U.K. Pension Plan Trustee Ltd.	United Kingdom
Cummins UK Holdings LLC	Indiana
Cummins Vendas e Servicos de Motores e Geradores Ltda.	Brazil
Cummins Venture Corporation	Delaware
Cummins West Africa Limited	Nigeria
Cummins West Balkans d.o.o. Nova Pasova	Serbia
Cummins XBorder Operations (Pty) Ltd	South Africa
Cummins (Xiangyang) Machining Co. Ltd.	China
Cummins Zambia Ltd.	Zambia
Cummins Zimbabwe Pvt. Ltd.	Zimbabwe
Distribuidora Cummins Centroamerica Costa Rica, S.de R.L.	Costa Rica
Distribuidora Cummins Centroamerica El Salvador, S.de R.L.	El Salvador
Distribuidora Cummins Centroamerica Guatemala, Ltda.	Guatemala
Distribuidora Cummins Centroamerica Honduras, S.de R.L.	Honduras
Distribuidora Cummins de Panama, S. de R.L.	Panama
Distribuidora Cummins S.A.	Argentina
Distribuidora Cummins S.A. Sucursal Bolivia	Bolivia
Distribuidora Cummins S.A. Sucursal Uruguay	Uruguay
Distribuidora Cummins Sucursal Paraguay SRL	Paraguay
Dynamo Insurance Company, Inc.	Vermont
Energy-Ventures Angola, Lda.	Angola
Hydrogenics Corporation	Canada
Hydrogenics Europe N.V.	Belgium
Hydrogenics GmbH	Germany
Hydrogenics Holding GmbH	Germany
Hydrogenics USA, Inc.	Delaware
Newage Engineers GmbH	Germany
OOO Cummins	Russia
Power Group International (Overseas Holdings) B.V.	The Netherlands
Power Group International (Overseas Holdings) Ltd.	United Kingdom
Power Group International Ltd.	United Kingdom
Quickstart Energy Projects SpA	Chile
Shanghai Cummins Trade Co., Ltd.	China
Sky Power Holdco LLC	Delaware
Taiwan Cummins Sales & Services Co. Ltd.	Taiwan, Province of China
TOO Cummins	Kazakhstan
Wuxi Cummins Turbo Technologies Co. Ltd.	China

CUMMINS INC.

SUBSIDIARIES OF THE REGISTRANT

ZED Connect Inc.	Delaware

EXHIBIT 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-229659) and Form S-8 (Nos. 033-56115, 333-67391, 333-123368, 333-162796 (as amended by Post-Effective Amendment No.1), 333-172650, 333-181927 (as amended by Post-Effective Amendment No. 1), 333-184786, 333-218381 and 333-218387) of Cummins Inc. of our report dated February 8, 2022 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

Indianapolis, Indiana

February 8, 2022

EXHIBIT 24

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the "Company") for the Company's year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated: February 8, 2022

/s/ ROBERT J. BERNHARD

Robert J. Bernhard

Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the “Company”) for the Company’s year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated: February 8, 2022

/s/ FRANKLIN R. CHANG DIAZ

Franklin R. Chang Diaz

Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the “Company”) for the Company’s year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated:	February 8, 2022	/s/ BRUNO V. DI LEO ALLEN
		Bruno V. Di Leo Allen
		Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the “Company”) for the Company’s year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated:	February 8, 2022	/s/ STEPHEN B. DOBBS
		Stephen B. Dobbs
		Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the “Company”) for the Company’s year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated: February 8, 2022

/s/ CARLA A. HARRIS

Carla A. Harris
Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the "Company") for the Company's year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated:	February 8, 2022	/s/ ROBERT K. HERDMAN
		Robert K. Herdman
		Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the “Company”) for the Company’s year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated:	February 8, 2022	/s/ ALEXIS M. HERMAN
		Alexis M. Herman
		Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the “Company”) for the Company’s year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated:	February 8, 2022	/s/ THOMAS J. LYNCH
		Thomas J. Lynch
		Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the “Company”) for the Company’s year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated:	February 8, 2022	/s/ WILLIAM I. MILLER
		William I. Miller
		Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the "Company") for the Company's year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated: February 8, 2022

/s/ GEORGIA R. NELSON

Georgia R. Nelson

Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the "Company") for the Company's year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated: February 8, 2022

/s/ KIMBERLY A. NELSON

Kimberly A. Nelson

Director

CUMMINS INC.

2021 Form 10-K

POWER OF ATTORNEY

I hereby legally appoint each of Mark A. Smith and Christopher C. Clulow as my attorneys-in-fact and agents, with full power of substitution and re-substitution, to sign on my behalf the Annual Report on Form 10-K, and any and all amendments thereto, of Cummins Inc. (the "Company") for the Company's year ended December 31, 2021 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, and to do anything else that said attorneys-in-fact and agents or any of them, or his or her substitute or substitutes, may lawfully do or cause to be done consistent herewith.

Dated: February 8, 2022

/s/ KAREN H. QUINTOS

Karen H. Quintos

Director

EXHIBIT 31(a)

Certification

I, N. Thomas Linebarger, certify that:

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

Date: February 8, 2022

/s/ N. THOMAS LINEBARGER

N. Thomas Linebarger

Chairman and Chief Executive Officer

EXHIBIT 31(b)

Certification

I, Mark A. Smith, certify that:

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

Date: February 8, 2022

/s/ MARK A. SMITH

Mark A. Smith

Vice President and Chief Financial Officer

EXHIBIT 32

Cummins Inc.

CERTIFICATION PURSUANT TO

18 U.S.C. SECTION 1350,

AS ADOPTED PURSUANT TO

SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Cummins Inc. (the “Company”) on Form 10-K for the period ended December 31, 2021, as filed with the Securities and Exchange Commission on the date hereof (the “Report”), each of the undersigned officers of the Company, certify, pursuant to 18 U.S.C. ss. 1350, as adopted pursuant to ss. 906 of the Sarbanes-Oxley Act of 2002, that to the best of such officer's knowledge:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

February 8, 2022	/s/ N. THOMAS LINEBARGER
	N. Thomas Linebarger *Chairman and Chief Executive Officer*
February 8, 2022	/s/ MARK A. SMITH
	Mark A. Smith *Vice President and Chief Financial Officer*