

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

FORM 10-K

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

For the fiscal year ended **December 31, 2021**

or

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

For the transition period from _____ to _____



<u>Commission File Number</u>	<u>Exact Name of Registrant as Specified in its Charter, Principal Office Address and Telephone Number</u>	<u>State of Incorporation or Organization</u>	<u>I.R.S. Employer Identification No.</u>
001-38646	Dow Inc. 2211 H.H. Dow Way, Midland, MI 48674 (989) 636-1000	Delaware	30-1128146
001-03433	The Dow Chemical Company 2211 H.H. Dow Way, Midland, MI 48674 (989) 636-1000	Delaware	38-1285128

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

<u>Registrant</u>	<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Dow Inc.	Common Stock, par value \$0.01 per share	DOW	New York Stock Exchange
The Dow Chemical Company	0.500% Notes due March 15, 2027	DOW/27	New York Stock Exchange
The Dow Chemical Company	1.125% Notes due March 15, 2032	DOW/32	New York Stock Exchange
The Dow Chemical Company	1.875% Notes due March 15, 2040	DOW/40	New York Stock Exchange
The Dow Chemical Company	4.625% Notes due October 1, 2044	DOW/44	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.

Dow Inc. Yes No
The Dow Chemical Company 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.

Dow Inc. Yes No
The Dow Chemical Company 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.

Dow Inc. Yes No
The Dow Chemical Company 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).

Dow Inc.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
The Dow Chemical Company	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> 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.

Dow Inc.	Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>	Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>	Emerging growth company	<input type="checkbox"/>
The Dow Chemical Company	Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>	Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>	Emerging growth company	<input type="checkbox"/>

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

Dow Inc.	<input type="checkbox"/>
The Dow Chemical Company	<input type="checkbox"/>

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.

Dow Inc.	<input checked="" type="checkbox"/>
The Dow Chemical Company	<input checked="" type="checkbox"/>

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).

Dow Inc.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
The Dow Chemical Company	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

As of June 30, 2021, the aggregate market value of the common stock of Dow Inc. held by non-affiliates of Dow Inc. was approximately \$47.1 billion based on the last reported closing price of \$63.28 per share as reported on the New York Stock Exchange.

Dow Inc. had 735,747,193 shares of common stock, \$0.01 par value, outstanding at January 31, 2022. The Dow Chemical Company had 100 shares of common stock, \$0.01 par value, outstanding at January 31, 2022, all of which were held by the registrant's parent, Dow Inc.

The Dow Chemical Company meets the conditions set forth in General Instruction I(1)(a) and (b) for Form 10-K and therefore is filing this form in the reduced disclosure format.

DOCUMENTS INCORPORATED BY REFERENCE

Dow Inc.: Portions of Dow Inc.'s Proxy Statement for the 2022 Annual Meeting of Stockholders are incorporated herein by reference in Part III of this Annual Report on Form 10-K to the extent stated herein. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of Dow Inc.'s fiscal year ended December 31, 2021.

The Dow Chemical Company: None.

Dow Inc. and Subsidiaries The Dow Chemical Company and Subsidiaries

ANNUAL REPORT ON FORM 10-K
For the fiscal year ended December 31, 2021

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Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries

This Annual Report on Form 10-K is a combined report being filed by Dow Inc. and The Dow Chemical Company and its consolidated subsidiaries ("TDCC" and together with Dow Inc., "Dow" or the "Company"). This Annual Report on Form 10-K reflects the results of Dow and its consolidated subsidiaries, after giving effect to the distribution to DowDuPont Inc. ("DowDuPont" and effective June 3, 2019, n/k/a DuPont de Nemours, Inc. or "DuPont") of TDCC's agricultural sciences business ("AgCo") and specialty products business ("SpecCo") and the receipt of E. I. du Pont de Nemours and Company and its consolidated subsidiaries' ("Historical DuPont") ethylene and ethylene copolymers business (other than its ethylene acrylic elastomers business) ("ECP"). The U.S. GAAP consolidated financial results of Dow Inc. and TDCC reflect the distribution of AgCo and SpecCo as discontinued operations for the applicable periods presented as well as the receipt of ECP as a common control transaction from the closing of the merger with Historical DuPont on August 31, 2017. As a result of the parent/subsidiary relationship between Dow Inc. and TDCC, and considering that the financial statements and disclosures of each company are substantially similar, the companies are filing a combined report for this Annual Report on Form 10-K. The information reflected in this report is equally applicable to both Dow Inc. and TDCC, except where otherwise noted. Each of Dow Inc. and TDCC is filing information in this report on its own behalf and neither company makes any representation to the information relating to the other company.

Background

On April 1, 2019, DowDuPont completed the separation of its materials science business and Dow Inc. became the direct parent company of TDCC and its consolidated subsidiaries, owning all of the outstanding common shares of TDCC. For filings relating to the period commencing April 1, 2019 and thereafter, TDCC was deemed the predecessor to Dow Inc., and the historical results of TDCC are deemed the historical results of Dow Inc. for periods prior to and including March 31, 2019.

The separation was contemplated by the merger of equals transaction effective August 31, 2017, under the Agreement and Plan of Merger, dated as of December 11, 2015, as amended on March 31, 2017. TDCC and Historical DuPont each merged with subsidiaries of DowDuPont and, as a result, TDCC and Historical DuPont became subsidiaries of DowDuPont (the "Merger"). Subsequent to the Merger, TDCC and Historical DuPont engaged in a series of internal reorganization and realignment steps to realign their businesses into three subgroups: agriculture, materials science and specialty products. Dow Inc. was formed as a wholly owned subsidiary of DowDuPont to serve as the holding company for the materials science business.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

Certain statements in this report are "forward-looking statements" within the meaning of the federal securities laws, including Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Such statements often address expected future business and financial performance, financial condition, and other matters, and often contain words or phrases such as "anticipate," "believe," "estimate," "expect," "intend," "may," "opportunity," "outlook," "plan," "project," "seek," "should," "strategy," "target," "will," "will be," "will continue," "will likely result," "would" and similar expressions, and variations or negatives of these words or phrases.

Forward-looking statements are based on current assumptions and expectations of future events that are subject to risks, uncertainties and other factors that are beyond Dow's control, which may cause actual results to differ materially from those projected, anticipated or implied in the forward-looking statements and speak only as of the date the statements were made. These factors include, but are not limited to: sales of Dow's products; Dow's expenses, future revenues and profitability; the continuing global and regional economic impacts of the coronavirus disease 2019 ("COVID-19") pandemic and other public health-related risks and events on Dow's business; capital requirements and need for and availability of financing; unexpected barriers in the development of technology, including with respect to Dow's contemplated capital and operating projects; Dow's ability to realize its commitment to carbon neutrality on the contemplated timeframe; size of the markets for Dow's products and services and ability to compete in such markets; failure to develop and market new products and optimally manage product life cycles; the rate and degree of market acceptance of Dow's products; significant litigation and environmental matters and related contingencies and unexpected expenses; the success of competing technologies that are or may become available; the ability to protect Dow's intellectual property in the United States and abroad; developments related to contemplated restructuring activities and proposed divestitures or acquisitions such as workforce reduction, manufacturing facility and/or asset closure and related exit and disposal activities, and the benefits and costs associated with each of the foregoing; fluctuations in energy and raw material prices; management of process

safety and product stewardship; changes in relationships with Dow's significant customers and suppliers; changes in consumer preferences and demand; changes in laws and regulations, political conditions or industry development; global economic and capital markets conditions, such as inflation, market uncertainty, interest and currency exchange rates, and equity and commodity prices; business or supply disruptions; security threats, such as acts of sabotage, terrorism or war; weather events and natural disasters; and disruptions in Dow's information technology networks and systems.

Risks related to Dow's separation from DowDuPont include, but are not limited to: (i) Dow's failure to achieve in full the anticipated benefits from the separation from DowDuPont; (ii) certain tax risks associated with the separation; (iii) the failure of Dow's pro forma financial information to be a reliable indicator of Dow's future results; (iv) receipt of less favorable terms in the commercial agreements Dow entered into with DuPont de Nemours, Inc. ("DuPont") and Corteva, Inc. ("Corteva"), including restrictions under intellectual property cross-license agreements, than Dow would have received from an unaffiliated third party; and (v) Dow's obligation to indemnify DuPont and/or Corteva for certain liabilities.

Where, in any forward-looking statement, an expectation or belief as to future results or events is expressed, such expectation or belief is based on the current plans and expectations of management and expressed in good faith and believed to have a reasonable basis, but there can be no assurance that the expectation or belief will result or be achieved or accomplished. A detailed discussion of principal risks and uncertainties which may cause actual results and events to differ materially from such forward-looking statements is included in the section of this Annual Report on Form 10-K titled "Risk Factors." These are not the only risks and uncertainties that Dow faces. There may be other risks and uncertainties that Dow is unable to identify at this time or that Dow does not currently expect to have a material impact on its business. If any of those risks or uncertainties develops into an actual event, it could have a material adverse effect on Dow's business. Dow Inc. and TDCC assume no obligation to update or revise publicly any forward-looking statements whether because of new information, future events, or otherwise, except as required by securities and other applicable laws.

Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries
PART I

ITEM 1. BUSINESS

THE COMPANY

Dow Inc. was incorporated on August 30, 2018, under Delaware law, to serve as a holding company for The Dow Chemical Company and its consolidated subsidiaries ("TDCC" and together with Dow Inc., "Dow" or the "Company"). Dow Inc. operates all of its businesses through TDCC, a wholly owned subsidiary, which was incorporated in 1947 under Delaware law and is the successor to a Michigan corporation, of the same name, organized in 1897. The Company's principal executive offices are located at 2211 H.H. Dow Way, Midland, Michigan 48674.

Available Information

The Company's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, are available free of charge at www.dow.com/investors, as soon as reasonably practicable after the reports are electronically filed or furnished with the U.S. Securities and Exchange Commission ("SEC"). The SEC maintains a website that contains these reports as well as proxy statements and other information regarding issuers that file electronically. The SEC's website is www.sec.gov. Dow's website and its content are not deemed incorporated by reference into this report.

MERGER AND SEPARATION

On April 1, 2019, DowDuPont Inc. ("DowDuPont" and effective June 3, 2019, n/k/a DuPont de Nemours, Inc. or "DuPont") completed the separation of its materials science business and Dow Inc. became the direct parent company of TDCC and its consolidated subsidiaries, owning all of the outstanding common shares of TDCC.

The separation was contemplated by the merger of equals transaction effective August 31, 2017, under the Agreement and Plan of Merger, dated as of December 11, 2015, as amended on March 31, 2017 (the "Merger Agreement"). TDCC and E. I. du Pont de Nemours and Company and its consolidated subsidiaries ("Historical DuPont") each merged with subsidiaries of DowDuPont and, as a result, TDCC and Historical DuPont became subsidiaries of DowDuPont (the "Merger"). Subsequent to the Merger, TDCC and Historical DuPont engaged in a series of internal reorganization and realignment steps to realign their businesses into three subgroups: agriculture, materials science and specialty products. Dow Inc. was formed as a wholly owned subsidiary of DowDuPont to serve as the holding company for the materials science business.

The consolidated financial results of Dow for periods prior to April 1, 2019, reflect the distribution of TDCC's agricultural sciences business ("AgCo") and specialty products business ("SpecCo") as discontinued operations for the applicable periods presented as well as reflect the receipt of Historical DuPont's ethylene and ethylene copolymers businesses (other than its ethylene acrylic elastomers business) ("ECP") as a common control transaction from the closing of the Merger on August 31, 2017. See Note 3 to the Consolidated Financial Statements and Dow Inc.'s Amendment No. 4 to the Registration Statement on Form 10 filed with the SEC on March 8, 2019, for additional information.

Throughout this Annual Report on Form 10-K, unless otherwise indicated, amounts and activity are presented on a continuing operations basis.

ABOUT DOW

Dow combines global breadth; asset integration and scale; focused innovation and materials science expertise; leading business positions; and environmental, social and governance (ESG) leadership to achieve profitable growth and deliver a sustainable future. The Company's ambition is to become the most innovative, customer centric, inclusive and sustainable materials science company in the world. Dow's portfolio of plastics, industrial intermediates, coatings and silicones businesses delivers a broad range of differentiated, science-based products and solutions for its customers in high-growth market segments, such as packaging, infrastructure, mobility and consumer applications. Dow operates 104 manufacturing sites in 31 countries and employs approximately 35,700 people.

BUSINESS SEGMENTS AND PRODUCTS

The Company conducts its worldwide operations through six global businesses which are organized into the following operating segments: Packaging & Specialty Plastics, Industrial Intermediates & Infrastructure and Performance Materials & Coatings. Corporate contains the reconciliation between the totals for the operating segments and the Company's totals. The Company did not aggregate any operating segments when determining its reportable segments. See Part II, Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations and Note 26 to the Consolidated Financial Statements for additional information concerning the Company's operating segments,

PACKAGING & SPECIALTY PLASTICS

The Packaging & Specialty Plastics operating segment consists of two highly integrated global businesses: Hydrocarbons & Energy and Packaging and Specialty Plastics. The segment employs the industry's broadest polyolefin product portfolio, supported by the Company's proprietary catalyst and manufacturing process technologies. These differentiators, plus collaboration at the customer's design table, enable the segment to deliver more reliable, durable, higher-performing solutions designed for recyclability and enhanced plastics circularity and sustainability. The segment serves customers, brand owners and ultimately consumers in key markets including food and specialty packaging; industrial and consumer packaging; health and hygiene; caps, closures and pipe applications; consumer durables; mobility and transportation; and infrastructure.

The Company's unique advantages compared with its competitors include: extensive low-cost feedstock positions around the world; unparalleled scale, global footprint and market reach; world-class manufacturing sites in every geographic region; deep customer and brand owner understanding; portfolio of higher-value functional polymers, such as polyolefin elastomers, semiconductive and jacketing compound solutions and wire and cable insulation; and market-driven application development and technical support.

The segment remains agile by participating in the entire ethylene-to-polyethylene chain integration, enabling the Company to manage market swings with industry-leading feedstock and derivative flexibility, and therefore optimize returns while reducing long-term earnings volatility. The Company's unrivaled value chain ownership is further strengthened by its Pack Studio locations in every geographic region, which help customers and brand owners deliver faster and more efficient packaging product commercialization through a global network of laboratories, technical experts and testing equipment.

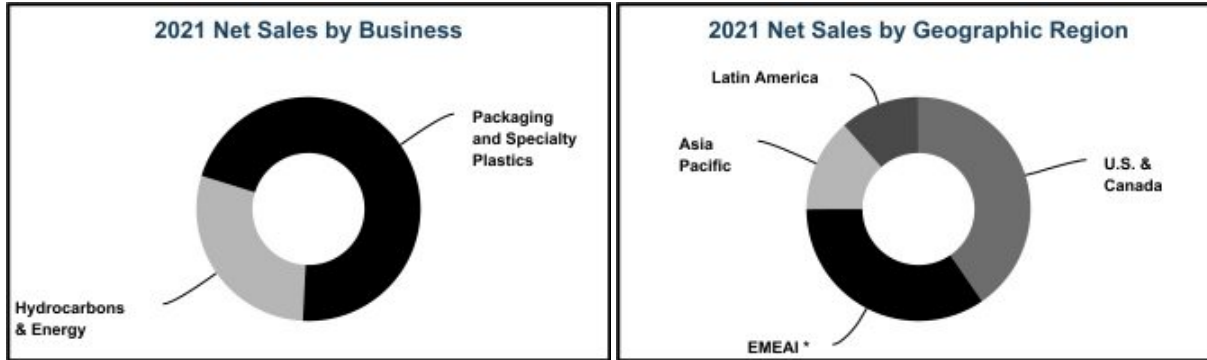
Hydrocarbons & Energy

Hydrocarbons & Energy is a leading global producer of ethylene, a key chemical building block that the Company consumes primarily within the Packaging & Specialty Plastics segment. Ethylene is transferred to downstream derivative businesses at market-based prices, which are generally equivalent to prevailing market prices for large volume purchases. In addition to ethylene, the business is a leading producer of propylene and aromatics products that are used to manufacture materials consumers use every day. The business also produces and procures the power and feedstocks used by the Company's manufacturing sites.

Packaging and Specialty Plastics

Packaging and Specialty Plastics serves growing, high-value sectors using world-class technology, broad existing product lines, and a rich product pipeline that creates competitive advantages for the entire packaging value chain. The business is a recognized leader in the production, marketing and innovation of polyethylene. The business is also a leader in other ethylene derivatives, such as polyolefin elastomers, ethylene vinyl acetate and ethylene propylene diene monomer ("EPDM") rubber serving mobility and transportation, consumer, wire and cable and construction end-markets. Market growth is expected to be driven by major shifts in population demographics; improving socioeconomic status in emerging geographic regions; consumer and brand owner demand for increased functionality including sustainable offerings through lower-carbon and circular solutions; global efforts to reduce food waste; growth in telecommunications networks; global development of electrical transmission and distribution infrastructure; and renewable energy applications such as wind power and solar (photovoltaic).

Details on Packaging & Specialty Plastics' 2021 net sales, by business and geographic region, are as follows:



* Europe, Middle East, Africa and India ("EMEAI")

Products

Major applications/market segments and products are listed below by business:

<i>Business</i>	<i>Applications/Market Segments</i>	<i>Major Products</i>	<i>Key Raw Materials</i>	<i>Key Competitors</i>
Hydrocarbons & Energy	Purchaser of feedstocks; production of cost competitive hydrocarbon monomers utilized by Dow's derivative businesses; and energy, principally for use in Dow's global operations	Ethylene, propylene, benzene, butadiene, octene, aromatics co-products, power, steam, other utilities	Butane, condensate, ethane, naphtha, natural gas, propane	Chevron Phillips Chemical, ExxonMobil, INEOS, LyondellBasell, SABIC, Shell, Sinopec
Packaging and Specialty Plastics	Adhesives; automotive; caps, closures and pipe applications; construction; cosmetics; electrical transmission and distribution; food and supply chain packaging; footwear; health and hygiene; housewares; industrial specialty applications using polyolefin elastomers, ethylene copolymers, and EPDM; irrigation pipe; mobility; photovoltaic encapsulants; sporting goods; telecommunications infrastructure; toys and infant products	Acrylics, bio-based plasticizers, copolymer, elastomers, ethylene copolymer resins, EPDM, ethylene vinyl acetate ("EVA"), methacrylic acid copolymer resins, polyethylene ("PE"), high-density polyethylene ("HDPE"), low-density polyethylene ("LDPE"), linear low-density polyethylene ("LLDPE"), polyolefin plastomers, resin additives and modifiers, semiconductive and jacketing compound solutions and wire and cable insulation	Aliphatic solvent, butene, ethylene, hexene, octene, propylene	Borealis, ExxonMobil, INEOS, Lanxess, LyondellBasell, Nova, SABIC

Joint Ventures:

This segment includes a portion of the Company's share of the results of the following joint ventures:

- EQUATE Petrochemical Company K.S.C.C. ("EQUATE") - a Kuwait-based company that manufactures ethylene, polyethylene and ethylene glycol, and manufactures and markets monoethylene glycol, diethylene glycol and polyethylene terephthalate resins; owned 42.5 percent by the Company.
- The Kuwait Olefins Company K.S.C.C. ("TKOC") - a Kuwait-based company that manufactures ethylene and ethylene glycol; owned 42.5 percent by the Company.
- Map Ta Phut Olefins Company Limited ("Map Ta Phut") - a Thailand-based company that manufactures propylene and ethylene; the Company has an effective ownership of 32.77 percent (of which 20.27 percent is owned directly by the Company and aligned with the Industrial Intermediates & Infrastructure segment and 12.5 percent is owned indirectly through the Company's equity interest in Siam Polyethylene Company Limited, an entity that is part of The SCG-Dow Group and aligned with the Packaging & Specialty Plastics segment).
- Sadara Chemical Company ("Sadara") - a Saudi Arabian company that manufactures chlorine, ethylene, propylene and aromatics for internal consumption and manufactures and sells polyethylene, ethylene oxide and propylene oxide derivative products, and isocyanates; owned 35 percent by the Company. The Company is responsible for marketing a majority of Sadara products outside of the Middle East zone through the Company's established sales channels. As part of this arrangement, the Company purchases and sells Sadara products for a marketing fee.

This segment also includes the Company's share of the results of the following joint ventures:

- The Kuwait Styrene Company K.S.C.C. - a Kuwait-based company that manufactures styrene monomer; owned 42.5 percent by the Company.
- The SCG-Dow Group - a group of Thailand-based companies (consisting of Siam Polyethylene Company Limited; Siam Polystyrene Company Limited; Siam Styrene Monomer Company Limited; and Siam Synthetic Latex Company Limited) that manufactures polyethylene, polystyrene, styrene, latex and specialty elastomers; owned 50 percent by the Company.

Current and Future Investments

In 2021, the Company completed the addition of a furnace to its ethylene production facility in Alberta, Canada, incrementally expanding capacity by approximately 130,000 metric tons. Dow co-invested in the expansion with a regional customer, evenly sharing project costs and ethylene output, with the additional ethylene to be consumed by existing polyethylene manufacturing assets in the region. Also, the Company completed a new catalyst production facility for key catalysts licensed by Univation Technologies, LLC, a wholly owned subsidiary of the Company.

Additionally, the Company has announced investments over the next several years that are expected to enhance competitiveness. These include:

- Incremental debottleneck projects across its global asset network that will deliver approximately 350 kilotonnes per annum of additional polyethylene, the majority of which will be in the U.S. & Canada.
- Construction of a world-scale polyethylene unit on the U.S. Gulf Coast based on Dow's proprietary process technologies, to meet consumer-driven demand in specialty packaging, health and hygiene, and industrial and consumer packaging applications.
- Construction of the world's first net-zero carbon emissions (with respect to Scope 1 and 2 carbon dioxide (CO₂) emissions, including technology advancements) ethylene and derivatives complex in Alberta, Canada.

The Company's ambition includes becoming the most sustainable materials science company, with a strategy to advance the well-being of humanity by helping lead the transition to a sustainable planet and society. This includes lowering energy and greenhouse gas emissions and further enabling a shift to a circular economy for plastics by focusing on resource efficiency and integrating recycled content and renewable feedstocks into its production processes. As part of that strategy, Dow announced the following in 2021:

- Plans to construct the world's first net-zero carbon emissions (with respect to Scope 1 and 2 carbon dioxide emissions, including technology advancements) ethylene facility and convert the assets at its Fort Saskatchewan site in Alberta, Canada, to create the first net-zero carbon emissions complex with respect to Scope 1 and 2 carbon dioxide emissions. The project would more than triple Dow's ethylene and polyethylene capacity from its Fort Saskatchewan, Alberta site, while retrofitting the site's existing assets to net-zero carbon emissions.
- Dow and Fuenix Ecology Group expanded upon the companies' initial agreement to scale circular plastics production through advanced recycling with the construction of a second plant in Weert, The Netherlands. The new plant will process 20,000 tonnes of plastic waste into pyrolysis oil feedstocks, which will be used to produce new circular plastic at Dow's Terneuzen site in The Netherlands.
- A partnership with Mura Technology ("Mura") to rapid-scale new advanced recycling solutions. The collaboration will produce circular feedstocks, which are converted into recycled plastics. Mura's global rollout targets 1 million metric tonnes of recycling capacity by 2025. Dow will be the major off-taker of pyrolysis oil feedstocks made from Mura's first-of-its-kind plant in Teesside, United Kingdom.
- Finalization of an agreement with Gunvor Petroleum Rotterdam ("Gunvor") to purify pyrolysis oil feedstocks derived from plastic waste. Gunvor began supplying cracker-ready feedstocks to Dow in 2021, which will be used to produce circular plastics for customers.
- Fast-tracking the design, engineering and construction of a market development scale purification unit in Terneuzen, The Netherlands, to provide additional capacity to purify pyrolysis oil feedstocks derived from plastic waste.
- Establishment of a multi-year agreement with New Hope Energy, based in Tyler, Texas, to supply the Company with pyrolysis oil feedstocks derived from plastics recycled in North America. New Hope Energy converts used plastics into pyrolysis oil feedstocks, which Dow will use to produce circular plastics.

- Dow signed new renewable and cleaner power agreements which are expected to reduce Scope 2 emissions by more than 600,000 metric tons of carbon dioxide equivalent per year.
- Plans to construct a clean hydrogen plant where by-products from core production processes would be converted into hydrogen and carbon dioxide. The carbon dioxide would be captured and stored until alternative technologies develop. Dow will also look for ways to enable usage of the carbon dioxide in its processes rather than storing it. The hydrogen plant is expected to startup in 2026 and would allow Dow's Terneuzen manufacturing site to reduce carbon dioxide emissions by approximately 1.4 million tons per year.

In addition, in 2019, the Company announced the retrofit of one of its Louisiana steam crackers with Dow's proprietary fluidized catalytic dehydrogenation ("FCDh") technology to produce on-purpose propylene. The FCDh technology retrofit further improves Dow's ability to continue to source the most advantaged feedstocks, while also producing reliable and cost-efficient on-purpose propylene to supply its integrated derivative units in Louisiana. Dow's FCDh technology reduces capital outlay by up to 40 percent and lowers energy usage and greenhouse gas emissions by up to 20 percent, thereby improving overall sustainability when compared with conventional propane dehydrogenation technologies. The project is expected to begin producing on-purpose propylene in the second half of 2022.

INDUSTRIAL INTERMEDIATES & INFRASTRUCTURE

The Industrial Intermediates & Infrastructure operating segment consists of two customer-centric global businesses - Industrial Solutions and Polyurethanes & Construction Chemicals - that develop important intermediate chemicals that are essential to manufacturing processes, as well as downstream, customized materials and formulations that use advanced development technologies. These businesses primarily produce and market ethylene oxide and propylene oxide derivatives that are aligned to market segments as diverse as appliances, coatings, electronics, surfactants for cleaning and sanitization, infrastructure and oil and gas. The businesses' global scale and reach, world-class technology, research and development capabilities and materials science expertise enable the Company to be a premier solutions provider offering customers value-add sustainable solutions to enhance comfort, energy efficiency, product effectiveness and durability across a wide range of home comfort and appliance, building and construction, mobility and transportation, adhesive and lubricant applications, among others.

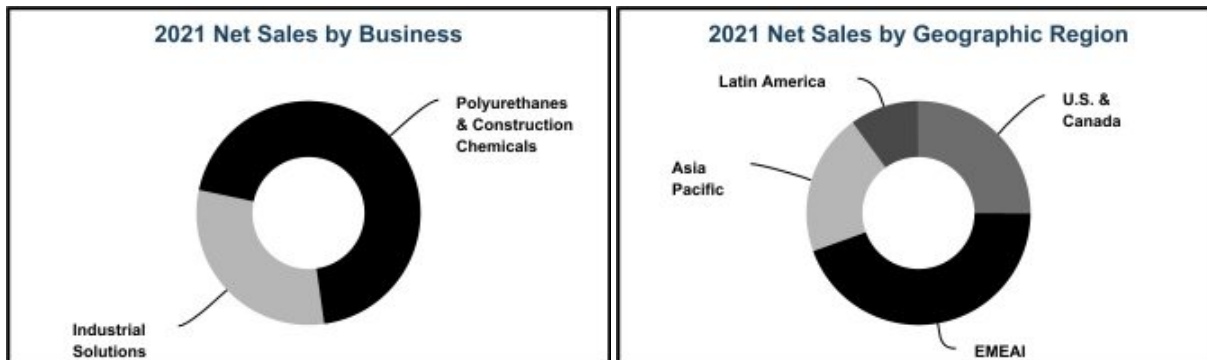
Industrial Solutions

Industrial Solutions provides a broad portfolio of solutions that enable and improve the manufacture of consumer and industrial goods and services. The business' solutions minimize friction and heat in mechanical processes; manage the oil and water interface; deliver ingredients for maximum effectiveness; facilitate dissolvability; enable product identification; decarbonize oil and gas products; reduce energy and water use in textiles; and provide the foundational building blocks for the development of chemical technologies. The business supports manufacturers across a large variety of end-markets, notably coatings, detergents and cleaners, crop protection, pharmaceuticals, electronics, oil and gas, inks and textiles. The business is a leading producer of purified ethylene oxide, ethylene amines and ethanol amines.

Polyurethanes & Construction Chemicals

Polyurethanes & Construction Chemicals consists of three businesses: Polyurethanes, Chlor-Alkali & Vinyl ("CAV") and Construction Chemicals. The Polyurethanes business is the world's largest producer of propylene oxide, propylene glycol and polyether polyols, and a leading producer of aromatic isocyanates and fully formulated polyurethane systems for rigid, semi-rigid and flexible foams, as well as coatings, adhesives, sealants, elastomers and composites that serve energy efficiency, consumer comfort, industrial and enhanced mobility market sectors. The CAV business provides chlorine and caustic soda supply and markets caustic soda, a valuable co-product of the chlor-alkali manufacturing process, and ethylene dichloride and vinyl chloride monomer. The CAV business' assets are predominantly in Western Europe and largely produce materials for internal consumption. The Construction Chemicals business provides cellulose ethers, redispersible latex powders, and acrylic emulsions used as key building blocks for differentiated building and construction materials across many market segments and applications ranging from roofing and flooring to gypsum-, cement-, concrete- and dispersion-based building materials. Both Polyurethanes and Construction Chemicals deliver more sustainable products aligned toward green building markets yielding reduced environmental impacts and lower product intensity compared to traditional offerings.

Details on Industrial Intermediates & Infrastructures' 2021 net sales, by business and geographic region, are as follows:



Products

Major applications/market segments and products are listed below by business:

Business	Applications/Market Segments	Major Products	Key Raw Materials	Key Competitors
Industrial Solutions	Broad range of products for specialty applications, including pharmaceuticals, agriculture crop protection offerings, aircraft deicing, solvents for coatings, heat transfer fluids for concentrated solar power, construction, solvents for electronics processing, food preservation, fuel markers, industrial and institutional cleaning, infrastructure applications, lubricant additives, paper, transportation and utilities; products for energy markets including exploration, production, transmission, refining, mining and gas processing to optimize supply, improve efficiencies and manage emissions	Butyl glycol ethers, VERSENE™ Chelants, UCAR™ Deicing Fluids, ethanalamines, ethylene oxide ("EO"), ethyleneamines, UCON™ Fluids, DOWANOL™ glycol ethers, DOWTHERM™ Heat Transfer Fluids, higher glycols, isopropanolamines, low-VOC solvents, methoxypolyethylene glycol, methyl isobutyl, polyalkylene glycol, CARBOWAX™ SENTRY™ Polyethylene Glycol, TERGITOL™, TRITON™ and ECOFAST™ Pure Surfactants, demulsifiers, drilling and completion fluids, heat transfer fluids, rheology modifiers, scale inhibitors, shale inhibitors, specialty amine solvents, surfactants, water clarifiers, frothing separating agents	Ethylene, propylene	BASF, Eastman, Hexion, Huntsman, INEOS, LyondellBasell, SABIC, Sasol, Shell
Polyurethanes & Construction Chemicals	Aircraft deicing fluids; alumina, pulp and paper; appliances; automotive; bedding; building and construction; flooring; footwear; heat transfer fluids; hydraulic fluids; infrastructure; mobility; packaging; textiles and transportation; construction; caulks and sealants; cement-based tile adhesives; concrete solutions; elastomeric roof coatings; industrial non-wovens; plasters and renders; roof tiles and siding; sport grounds and tape joint compounds	Aniline, caustic soda, ethylene dichloride ("EDC"), methylene diphenyl diisocyanate ("MDI"), polyether polyols, propylene glycol ("PG"), propylene oxide ("PO"), polyurethane systems, toluene diisocyanate ("TDI"), vinyl chloride monomer ("VCM"), AQUASET™ Acrylic Thermosetting Resins, DOW™ Latex Powder, RHOPLEX™ and PRIMAL™ Acrylic Emulsion Polymers, WALOCEL™ Cellulose Ethers	Aniline, benzene, carbon monoxide, caustic soda, cell effluent, cellulose, chlorine, electric power, ethylene, hydrogen peroxide, propylene, styrene	Arkema, Ashland, BASF, Covestro, Eastman, Huntsman, Wanhua

Joint Ventures

This segment includes a portion of the Company's share of the results of EQUATE, TKOC, Map Ta Phut and Sadara.

Current and Future Investments

The Company expects to make investments over the next several years to enhance competitiveness in its Polyurethanes & Construction Chemicals and Industrial Solutions businesses. The investments will include alkoxylation capacity expansions and finishing capabilities; investments to support growth in polyurethane systems; and efficiency improvements around the world.

In 2021, the Company completed a debottlenecking project along the U.S. Gulf Coast to increase aniline production by 60,000 tons per year, which will drive higher integrated margins for the portfolio. Also, in the past year, the Company completed key projects aligned to longer-term sustainability goals, including the first industrial-scale production unit aligned to the RENUVA™ Mattress Recycling Program. This project represents a fully circular investment across the value chain highlighting Dow's materials science solutions to critical challenges facing the industry.

In 2021, the Company expanded polyethylene glycol production with a new facility in St. Charles, Louisiana. This investment supports growth in the pharmaceutical market and increases capacity by 35 metric tons annually. In addition, construction began on a new specialty alkoxylation reactor in Plaquemine, Louisiana. This investment, expected to be completed in the second half of 2022, will add 60 metric tons of annual capacity for the home and personal care market.

In 2021, the Company announced the following:

- Plans to build an integrated MDI distillation and prepolymers facility at its site in Freeport, Texas. This investment supports increasing demand for downstream polyurethane systems products and advances Dow's leading positions in attractive applications in construction, consumer, and industrial markets that are growing above gross domestic product. The new Freeport MDI facility will replace Dow's current North America capacity in La Porte, Texas, and will also be capable of supplying an additional 30 percent of product to Dow's customers. In coordination with the start-up of the new MDI facility expected in 2023, Dow will shut down its polyurethane assets at the La Porte site.
- Plans to increase propylene glycol capacity at its existing joint venture facility in Map Ta Phut, Thailand by 80,000 tons per year – bringing total capacity to 250,000 tons per year. The additional capacity will support customer growth across Asia Pacific and India and is expected to come online in 2024.
- A signed Memorandum of Understanding with the Zhanjiang Economic and Technological Development Zone Administrative Committee (Zhanjiang EDZ) to build the Dow South China Specialties Hub, a multi-year project providing customers local access to Dow's portfolio of high value products and innovative technologies. The new manufacturing hub would extend Dow's local reach, further enhancing supply reliability, responsiveness to market needs and customized innovation, and better positions customers for success in markets including mobility, pharmaceuticals, cleaning chemicals, apparel, home and personal care, lubricants and adhesives.
- Dow and Ralph Lauren Corporation released a detailed manual on how to dye cotton more sustainably and more effectively than ever before using ECOFAST™ Pure Sustainable Textile Treatment. Pretreating fabric with ECOFAST™ Pure helps significantly reduce the amount of water, chemicals and energy needed to color cotton, by enabling up to 90 percent less process chemicals, 50 percent less water, 50 percent less dyes and 40 percent less energy without sacrificing color or quality.
- Dow and Orion Chemicals Orgaform together with Eco-mobilier, H&S Anlagentechnik and The Vita Group have inaugurated a pioneering mattress recycling plant as part of the RENUVA™ program. This is a major step forward for the recovery and recycling of polyurethane foam and a significant advancement to close the loop for end-of-life mattresses. At full capacity the plant will process up to 200,000 mattresses per year to address growing mattress waste.

PERFORMANCE MATERIALS & COATINGS

The Performance Materials & Coatings operating segment includes industry-leading franchises that deliver a wide array of solutions into consumer, infrastructure and mobility end-markets. The segment consists of two global businesses: Coatings & Performance Monomers and Consumer Solutions. These businesses primarily utilize the Company's acrylics-, cellulose- and silicone-based technology platforms to serve the needs of the architectural and industrial coatings; home care and personal care; consumer and electronics; mobility and transportation; industrial and chemical processing; and building and infrastructure end-markets. Both businesses employ materials science capabilities, global reach and unique products and technology to combine chemistry platforms to deliver differentiated, market-driven and sustainable innovations to customers.

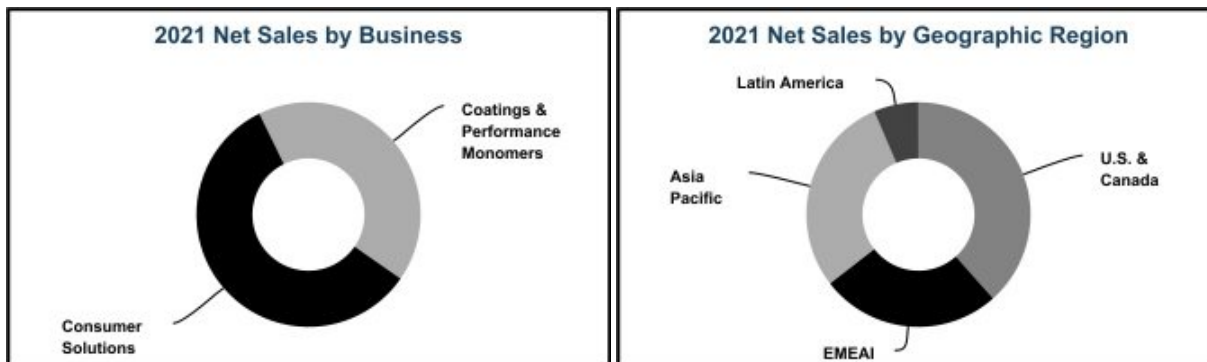
Coatings & Performance Monomers

Coatings & Performance Monomers consists of two businesses: Coating Materials and Performance Monomers. The Coating Materials business makes critical ingredients and additives that help advance the performance of paints and coatings. The business offers innovative and sustainable products to accelerate paint and coatings performance across diverse market segments, including architectural paints and coatings, as well as industrial coatings applications used in maintenance and protective industries, wood, metal packaging, traffic markings, thermal paper and leather. These products enhance coatings by improving hiding and coverage characteristics, enhancing durability against nature and the elements, lowering or eliminating volatile organic compounds ("VOC") content, reducing maintenance and improving ease of application. The Performance Monomers business manufactures acrylics-based building blocks needed for the production of coatings, textiles, adhesives and home and personal care products.

Consumer Solutions

Consumer Solutions consists of two businesses: Performance Silicones & Specialty Materials and Silicone Feedstocks & Intermediates. The Performance Silicones & Specialty Materials business delivers an unmatched portfolio of performance-enhancing silicone and specialty materials to meet the diverse needs of customers in fast-growing industries, including building and infrastructure; consumer and electronics; industrial and chemical processing; mobility and transportation; home care; and personal care. It focuses resources on delivering valuable differentiation via market-driven innovations and sustainable solutions, which address lower-carbon footprint and circularity goals while enabling continued growth. The Silicone Feedstocks & Intermediates business focuses on maximizing productivity and optimizing margins by leveraging Dow's scale and global reach. It is charged with producing silicon metal, siloxanes and intermediates, which are key materials to manufacture differentiated downstream silicone products.

Details on Performance Materials & Coatings' 2021 net sales, by business and geographic region, are as follows:



Products

Major applications/market segments and products are listed below by business:

Business	Applications/Market Segments	Major Products	Key Raw Materials	Key Competitors
Coatings & Performance Monomers	Acrylic binders for architectural paints and coatings, industrial coatings and paper; adhesives; dispersants; impact modifiers; inks and paints; opacifiers and surfactants for both architectural and industrial applications; plastics additives; processing aids; protective and functional coatings; rheology modifiers	ACOUSTICRYL™ Liquid-Applied Sound Damping Technology; acrylates; ACRY SOL™ Rheology Modifiers; AVANSE™ Acrylic Binders; EVOQUE™ Pre-Composite Polymer; foam cell promoters; FORMASHIELD™ Acrylic Binder; high-quality impact modifiers; MAINCOTE™ Acrylic Epoxy Hybrid; methacrylates; processing aids; RHOPLEX™ Acrylic Resin; TAMOL™ Dispersants; FASTRACK™ Road Marking Resins; vinyl acetate monomers; weatherable acrylic capstock compounds for thermoplastic and thermosetting materials	Acetic acid, acetone, acrylic acid, butyl acrylate, methyl methacrylate, propylene, styrene	Arkema, BASF, Celanese, Evonik, LyondellBasell, Wacker Chemie
Consumer Solutions	Personal care and home care; mobility and transportation; building and infrastructure; consumer and electronics; industrial and chemical processing	Adhesives and sealants; antifoams and surfactants; coatings and controlled release; coupling agents and crosslinkers; fluids, emulsions and dispersions; formulating and processing aids; granulation and binders; oils; polymers and emollients; opacifiers; reagents; resins, gels and powders; rheology modifiers; rubber; solubility enhancers; aerospace composites; surfactants and solvents; encapsulants for solar photovoltaic applications; SILASTIC™ Silicone Elastomers; DOWSIL™ Silicone Products; SYL-OFF™ Silicone Release Coatings; AMPLIFY™ Si PE 1000 Polymer System; bio-based, readily biodegradable SunSpheres™ BIO SPF Booster; ACUSOL™ PRIME 1 Polymer	Hydrochloric acid, methanol, platinum, silica, silicon metal	Elkem, Momentive, Shin-Etsu, Wacker Chemie

Current and Future Investments

The Company continues to make incremental investments in lower-capital, higher-return projects in the silicones franchise to further enhance competitiveness. The investments aim to expand manufacturing capacity of silicone polymers and high-performance sealants among other high-value materials.

In 2021, the Company announced several key growth capital projects to increase capacity of performance silicones and specialty materials. These projects have either come online in 2021 or are expected to start up over the next several years. These include:

- Silicone elastomers and thermally conductive materials meeting growing demand for vehicles, including autonomous and electric vehicles, hybrids and internal combustion engines, that are lighter, safer and have a lower-carbon footprint;
- Silicone polymers and sealants supporting greater design flexibility and enabling safe, sustainable, durable building and infrastructure;
- Silicone engineered materials and pressure sensitive adhesives improving reliability and efficiency in consumer and electronics end-markets; and
- Cationic hydroxyethylcellulose ("CatHEC") polymers and polyethylene glycols ("PEGs") addressing a variety of home and personal care applications.

CORPORATE

Corporate includes certain enterprise and governance activities (including insurance operations, environmental operations, etc.); non-business aligned joint ventures; non-business aligned litigation expenses; and discontinued or non-aligned businesses.

RAW MATERIALS

The Company operates in an integrated manufacturing environment. Basic raw materials are processed through many stages to produce a number of products that are sold as finished goods at various points in those processes. The major raw material stream that feeds the production of the Company's finished goods is hydrocarbon-based raw materials. The Company purchases hydrocarbon raw materials including ethane, propane, butane, naphtha and condensate as feedstocks. These raw materials are used in the production of both saleable products and energy. The Company also purchases and sells certain monomers, primarily ethylene and propylene, to balance internal production and internal consumption. The Company purchases natural gas, primarily to generate electricity, and purchases electric power to supplement internal generation. In addition, the Company produces a portion of its electricity needs in Louisiana and Texas; Alberta, Canada; The Netherlands; and Germany.

The Company's primary source of these raw materials are natural gas liquids ("NGLs"), which are derived from natural gas and crude oil production, and naphtha, which is produced during the processing and refining of crude oil. Given recent advancements in shale gas, shale oil and conventional drilling techniques, the Company expects these raw materials to be in abundant supply. The Company's suppliers of these raw materials include regional, international and national oil and gas companies.

The Company purchases raw materials on both short- and long-term contracts. The Company had adequate supplies of raw materials in 2021 and expects to continue to have adequate supplies of raw materials in 2022.

INDUSTRY SEGMENTS AND GEOGRAPHIC REGION RESULTS

See Note 26 to the Consolidated Financial Statements for information regarding net sales, pro forma net sales, Operating EBIT, pro forma Operating EBIT and total assets by segment, as well as net sales and long-lived assets by geographic region.

SIGNIFICANT CUSTOMERS AND PRODUCTS

All products and services are marketed primarily through the Company's sales force, although in some instances more emphasis is placed on sales through distributors. In 2021, no significant portion of the Company's sales was dependent upon a single customer.

PATENTS, LICENSES AND TRADEMARKS

The Company continually applies for and obtains U.S. and foreign patents and has a substantial number of pending patent applications throughout the world. At December 31, 2021, the Company owned approximately 3,600 active U.S. patents and 21,300 active foreign patents as follows:

Remaining Life of Patents Owned at Dec 31, 2021	<i>United States</i>	<i>Rest of World</i>
Within 5 years	700	3,800
6 to 10 years	1,200	7,400
11 to 15 years	1,500	9,500
16 to 20 years	200	600
Total	3,600	21,300

The Company's primary purpose in obtaining patents is to protect the results of its research for use in operations and licensing. The Company is party to a substantial number of patent licenses, including intellectual property cross-license agreements and other technology agreements, and also has a substantial number of trademarks and trademark registrations in the United States and in other countries, including the "Dow in Diamond" trademark. Although the Company considers that its patents, licenses and trademarks in the aggregate constitute a valuable asset, it does not regard its business as being materially dependent on any single or group of related patents, licenses or trademarks.

PRINCIPAL PARTLY OWNED COMPANIES

The Company's principal nonconsolidated affiliates at December 31, 2021, including direct and indirect ownership interest for each, are listed below:

<i>Principal Nonconsolidated Affiliate</i>	<i>Country</i>	<i>Ownership Interest</i>	<i>Business Description</i>
EQUATE Petrochemical Company K.S.C.C.	Kuwait	42.50 %	Manufactures ethylene, polyethylene and ethylene glycol, and manufactures and markets monoethylene glycol, diethylene glycol and polyethylene terephthalate resins
The Kuwait Olefins Company K.S.C.C.	Kuwait	42.50 %	Manufactures ethylene and ethylene glycol
The Kuwait Styrene Company K.S.C.C.	Kuwait	42.50 %	Manufactures styrene monomer
Map Ta Phut Olefins Company Limited ¹	Thailand	32.77 %	Manufactures propylene and ethylene
Sadara Chemical Company ²	Saudi Arabia	35.00 %	Manufactures chlorine, ethylene, propylene and aromatics for internal consumption and manufactures and sells polyethylene, ethylene oxide and propylene oxide derivative products, and isocyanates
The SCG-Dow Group:			
Siam Polyethylene Company Limited	Thailand	50.00 %	Manufactures polyethylene
Siam Polystyrene Company Limited	Thailand	50.00 %	Manufactures polystyrene
Siam Styrene Monomer Company Limited	Thailand	50.00 %	Manufactures styrene
Siam Synthetic Latex Company Limited	Thailand	50.00 %	Manufactures latex and specialty elastomers

1. The Company's effective ownership of Map Ta Phut is 32.77 percent, of which the Company directly owns 20.27 percent and indirectly owns 12.5 percent through its equity interest in Siam Polyethylene Company Limited.

2. The Company is responsible for marketing the majority of Sadara products outside of the Middle East zone through the Company's established sales channels. Under this arrangement, the Company purchases and sells Sadara products for a marketing fee. In March 2021, Dow and the Saudi Arabian Oil Company agreed to transition the marketing rights and responsibilities for Sadara's finished products to levels more consistent with each partner's equity ownership. This transition began in July 2021 and is being implemented over the next five years.

See Note 12 to the Consolidated Financial Statements for additional information regarding nonconsolidated affiliates.

PROTECTION OF THE ENVIRONMENT

The world is at a critical juncture and needs environmental leadership from all sectors. As a leading materials science company, Dow believes it has the responsibility and opportunity to take action and lead the industry in areas that Dow's science and expertise can make a difference. For that reason, Dow has integrated sustainability across its businesses and is collaborating across the globe to make inroads in the transition to a sustainable economy and society. The Company has identified three focus areas where it believes Dow is making a difference to drive industry-wide change:

- **Climate Protection** - As both a major user of energy and producer of technologies that are essential to a low-carbon future, the Company believes it has a responsibility to act. Dow has set an ambitious target to become carbon neutral by 2050 (Scopes 1+2+3, as defined by the Greenhouse Gas Protocol, plus product benefits) while helping its customers reduce their greenhouse gas emissions by innovating lower-carbon products.
- **Circular Economy** - As one of the world's largest producers of plastic, Dow is taking a leading role in supporting a more circular economy and ending plastic waste. Dow's "stop the waste" goal is a commitment to invest and/or collaborate in key technologies and infrastructure to significantly increase global recycling. Dow's "close the loop" goal is a commitment to help customers redesign and promote reusable or recyclable packaging applications.
- **Safer Materials** - As a world-leading materials science company, Dow plays a pivotal role in innovating materials that bring social and environmental value alongside business value. Dow is committed to innovating and bringing safer materials to the market by continuously evaluating and improving how the Company measures, designs, manufactures, reports, and acts on the impact of its products. Dow envisions a future where every material it brings to market is sustainable for people and the planet. To that end, Dow is innovating the sustainable materials of tomorrow by leading candid conversations about product safety and committing to the advancement of open and transparent chemistry with Dow's value chain partners, customers and the public.

To accelerate the Company's sustainability agenda, Dow announced new, multi-decade targets in 2020 to put the Company on a path to achieve carbon neutrality and eliminate plastic waste. These new targets align to and build upon Dow's 2025 Sustainability Goals – 10-year commitments aimed at magnifying the Company's positive impact through collaboration with like-minded partners. Targets include reducing the Company's net annual greenhouse gas emissions by an additional 5 million metric tons by 2030, compared with its 2020 baseline, a reduction of approximately 15 percent. This target follows the Company's reduction in greenhouse gas emissions of 15 percent from its 2005 baseline, which was achieved in 2020. The Company also intends to enable 1 million metric tons of plastic to be collected, reused or recycled through direct actions and partnerships by 2030. Dow will also work with customers, brand owners and the value chain to help redesign and promote reusable and recyclable packaging applications to enable 100 percent of Dow products sold into packaging applications to be reusable or recyclable by 2035. The Company's progress in achieving these targets is reviewed regularly by management and with the Environment, Health, Safety & Technology Committee of the Board.

Additional discussion of matters pertaining to the environment is included in Part I, Item 1A. Risk Factors; Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations; and Notes 1 and 16 to the Consolidated Financial Statements. In addition, detailed information on the Company's performance regarding environmental matters and goals is accessible through the Science & Sustainability webpage at www.dow.com/sustainability. Dow's website and its content are not deemed incorporated by reference into this report.

HUMAN CAPITAL

Dow's ambition – to be the most innovative, customer-centric, inclusive and sustainable materials science company in the world - starts with people. Dow employees create innovative and sustainable materials science solutions to advance the world. Every answer starts with asking the right questions. This is why the diverse, dedicated Dow team collaborates with customers and other stakeholders to find solutions to the world's toughest challenges. The Company's values of Respect for People, Integrity and Protecting Our Planet are fundamental beliefs that are ingrained in each action taken, can never be compromised and are the foundation of the Company's Code of Conduct.

The Company is dedicated to employee health and safety and is invested in fostering a culture of inclusion and continuous learning while supporting its employees through its Total Rewards plans and programs to ensure all Dow employees are respected, valued and encouraged to make their fullest contribution.

Safety, Employee Health and Well-Being

A commitment to safety and employee health is ingrained in Dow's culture and central to how the Dow team works. Dow uses a comprehensive, integrated operating discipline management system that includes policies, requirements, best practices and procedures associated with health and safety. In 2021, the Company achieved an Occupational Safety and Health Administration ("OSHA") Total Recordable Injury and Illness Rate of 0.14, based upon the number of incidents per 200,000 work hours for employees and contractors globally. This measure, along with a consistent set of globally applied, as well as locally defined, leading indicators of safety performance, are cornerstones of Dow's worker protection program. The Company maintains a robust, globally tracked near-miss program for situations that did not result in an injury, but could have been high consequence had circumstances been slightly different. This data is reviewed regularly by management and the Environment, Health, Safety & Technology Committee of the Dow Inc. Board of Directors ("Board"), is visible to all employees and is built into digital dashboards that include actual injury information for every Dow location around the world.

As part of the Company's total worker health strategy, employees have access to occupational health services at no cost through on-site, Company-managed clinics at its manufacturing locations or an offsite provider overseen by Dow Occupational Health. In addition to access for occupational health needs, the Company also has a comprehensive well-being strategy, which is framed across four dimensions – physical, mental, community and financial well-being – for an approach that is holistic, global, employee centered and outcome-driven. Key ambitions across the four dimensions focus on elements such as workplace stress, psychological safety, resiliency, workload, healthy eating and activities, and social community and inclusion opportunities.

Dow maintains active Crisis Management Teams at the corporate level and in each region where the Company operates to ensure appropriate plans are in place in the event of natural disasters or other emergencies, and currently in response to the coronavirus disease 2019 ("COVID-19") pandemic. For additional information on the Company's response to the COVID-19 pandemic, see Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

Inclusion, Diversity & Equity

At Dow, inclusion, diversity and equity ("ID&E") is a business imperative evidenced by inclusion serving as a core pillar of the Company's ambition statement. A strategic and intentional focus on ID&E not only enhances the employee experience and satisfaction, but it also supports innovation, customer experience and understanding of the communities the Company serves. In 2021, Dow ranked #19 in the DiversityInc Top 50 Companies for Diversity and for the first time was named to the *Fortune* 100 Best Companies to Work For® list. These are significant accomplishments that represent only two of the many awards the Company received related to its efforts in ID&E.

Dow's strategic ID&E efforts are directed by its Chief Inclusion Officer and Office of Inclusion, which supports implementation throughout Dow's businesses, functions and regions. Three Inclusion Councils drive the ID&E strategy from the top of the Company down and across the enterprise:

- The President's Inclusion Council defines and supports Dow's ID&E strategy from the top.
- A Senior Leaders' Inclusion Council influences change through senior and mid-level business, geographic and functional leaders.
- A Joint Inclusion Council collaborates to drive maximum employee engagement through Employee Resource Group ("ERG") leadership.

Dow's 10 ERGs are representative of the Company's diverse workforce and help foster an inclusive workplace. Dow's ERGs are organized around historically underrepresented groups including women, people of color, LGBTQ+ individuals, people with disabilities and veterans, as well as groups both for professionals who are new to the Company and those who are 50 years or older. Senior leaders serve as executive sponsors for each ERG. In 2021, 52 percent of Dow's workforce and 97 percent of Dow people leaders participated in at least one ERG. Also in 2021, Dow implemented a new Paid Time Off Policy, which provides employees time off to volunteer and engage in ERG activities.

Inclusion and diversity metrics, including ERG participation, global representation of women and U.S. ethnic minority representation in the United States, are published internally on a quarterly basis, are embedded in the same scorecard where Dow's financial and safety results are measured and are directly connected to leaders' annual performance and compensation. This data is reviewed regularly by management and with the Compensation and Leadership Development Committee of the Board.

Global pay disparity studies have been conducted at Dow for over 20 years to assess fair treatment between genders and between U.S. ethnic minorities and non-minorities and to ensure Dow's pay practices are being implemented as intended. As part of Dow's ID&E efforts, the Company will continue to conduct annual pay gap studies and actively engage with an external partner to further develop and continue to apply best practices.

Total Rewards

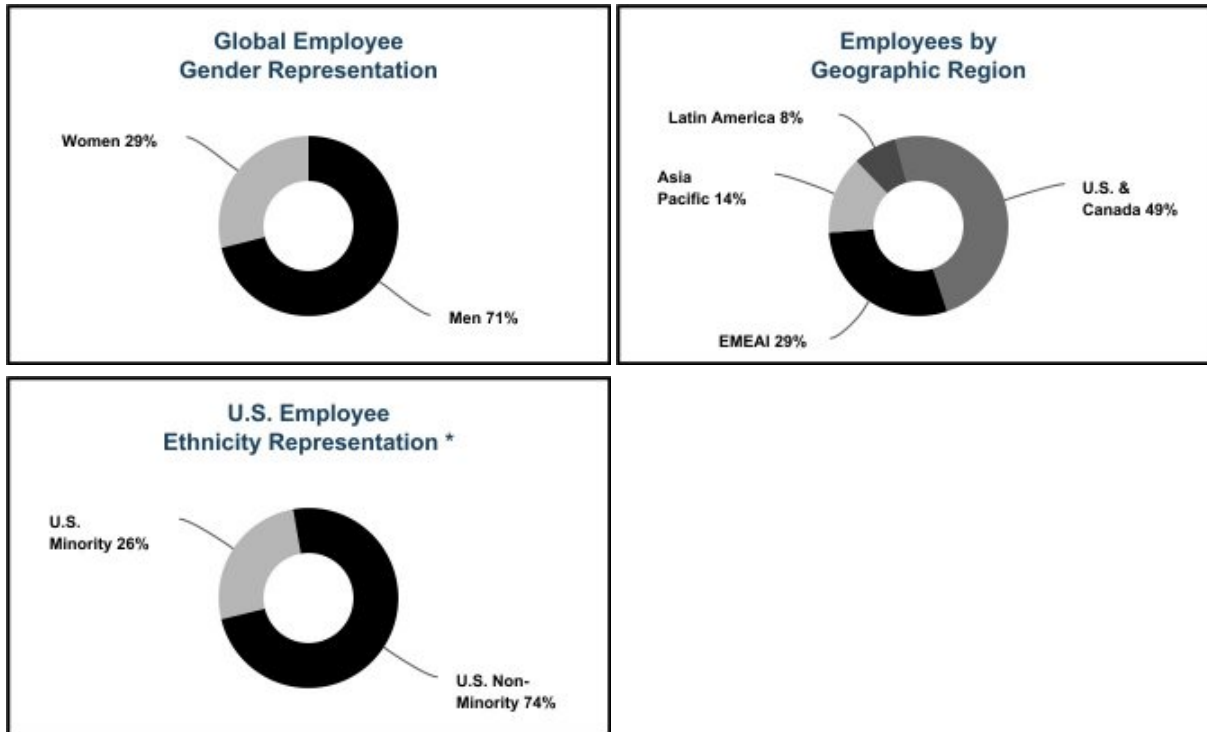
To achieve Dow's ambition to be the most innovative, customer-centric, inclusive and sustainable materials science company in the world, the Company invests in its people, who are at the heart of the Company, through its Total Rewards plans and programs. The Total Rewards plans and programs are structured to attract, retain and motivate Dow's employees. Dow's Total Rewards are designed to support all aspects of its employees – their compensation, future, health, life and career. The Company is committed to aligning its strategy and culture with the needs of its employees and optimizing the investment Dow makes in Total Rewards.

As a global company with a diverse team, Dow aims to ensure employees have access to resources that allow them to meet their unique needs. That is why Dow has established three guiding principles that define its Total Rewards strategy: 1) ensuring programs are market competitive, while leading peer companies in equitable and inclusive offerings; 2) providing employees with offerings that align with their preferences; and 3) offering programs that promote fulfilling career and life experiences. Dow adapts its programs for geography-specific requirements, as well as cultural standards and expectations.

Employee Engagement, Learning and Development

Throughout an employee's career, the Company supports development through a blend of learning approaches including in-person and virtual trainings, digital learning platforms, on-the-job training and a series of leadership development programs. Annually, all employees have the opportunity to provide feedback on employee experience and offer insights into how to improve Dow's working culture through a global employee opinion survey. A key component of the survey is an opportunity for employees to provide feedback on the effectiveness of their direct leader. In 2021, 70 percent of employees responded to the annual survey. The feedback received through this annual survey and additional quarterly checkpoint surveys is used to drive actions to improve the overall Dow experience for employees across the Company, as well as to support continuous improvement in leader effectiveness.

At December 31, 2021, the Company permanently employed approximately 35,700 people on a full-time basis.



* U.S. Minority includes employees who self-identify as Hispanic or Latino, Black or African American, Asian, American Indian or Alaskan Native, Native Hawaiian or other Pacific Islander, or two or more races. Employees who self-identify as White are considered U.S. Non-Minority.

Additional information regarding Dow's human capital measures can be found in the Company's annual Environmental, Social and Governance ("ESG") Report, as well as Dow's U.S. Equal Employment Opportunity Report (EEO-1), accessible through the Inclusion and Diversity webpage at www.dow.com/diversity. Dow's website and its content are not deemed incorporated by reference into this report.

OTHER ACTIVITIES

The Company engages in property and casualty insurance and reinsurance primarily through its Liana Limited subsidiaries.

EXECUTIVE OFFICERS OF THE REGISTRANT

Set forth below is information related to the Company's executive officers as of February 4, 2022:

<i>Name, Age</i>	<i>Present Position with Registrant</i>	<i>Year Elected as Executive Officer of Dow Inc.</i>	<i>Other Business Experience since January 1, 2017</i>
Jack Broodo, 63	President, Feedstocks & Energy	2020	Dow Inc.: President, Feedstocks & Energy since February 2020; Business President, Feedstocks & Energy from April 2019 to February 2020. TDCC: President, Feedstocks & Energy since February 2020; Business President, Feedstocks & Energy from February 2016 to February 2020.
Karen S. Carter, 51	Chief Human Resources Officer and Chief Inclusion Officer	2019	Dow Inc.: Chief Human Resources Officer and Chief Inclusion Officer since April 2019. TDCC: Chief Human Resources Officer since October 2018; Chief Inclusion Officer since July 2017; North America Commercial Vice President, Dow Packaging and Specialty Plastics from February 2016 to July 2017.
Diego Donoso, 54	President, Packaging & Specialty Plastics	2020	Dow Inc.: President, Packaging & Specialty Plastics since February 2020; Business President, Packaging & Specialty Plastics from April 2019 to February 2020. TDCC: President, Packaging & Specialty Plastics since February 2020; Business President, Packaging & Specialty Plastics from August 2012 to February 2020.
Ronald C. Edmonds, 64	Controller and Vice President of Controllers and Tax	2019	Dow Inc.: Controller and Vice President of Controllers and Tax since April 2019. TDCC: Controller and Vice President since November 2009; Vice President of Tax since January 2016.
Jim Fitterling, 60	Chairman and Chief Executive Officer	2018	Dow Inc.: Chairman since April 2020; Chief Executive Officer since August 2018. TDCC: Chairman since April 2020; Chief Executive Officer since July 2018; President and Chief Operating Officer from February 2016 to July 2018.
Mauro Gregorio, 59	President, Performance Materials & Coatings	2020	Dow Inc.: President, Performance Materials & Coatings since February 2020; Business President, Performance Materials & Coatings from April 2019 to February 2020. TDCC: President, Performance Materials & Coatings since February 2020; Business President, Consumer Solutions from January 2016 to February 2020.
Jane M. Palmieri, 52	President, Industrial Intermediates & Infrastructure	2020	Dow Inc.: President, Industrial Intermediates & Infrastructure since February 2020; Business President, Polyurethanes and Chlor-Alkali & Vinyl from April 2019 to February 2020. TDCC: President, Industrial Intermediates & Infrastructure since February 2020; Business President, Polyurethanes and Chlor-Alkali & Vinyl from April 2018 to February 2020; Business President, Polyurethanes and Chlor-Alkali from October 2016 to April 2018; Business President, Building and Construction from June 2013 to April 2018.
John M. Sampson, 61	Senior Vice President, Operations, Manufacturing & Engineering	2021	Dow Inc.: Senior Vice President, Operations, Manufacturing & Engineering since October 2020. Olin Corporation: Executive Vice President, Business Operations from April 2019 to September 2020; Vice President, Business Operations from October 2015 to April 2019.
A. N. Sreeram, 54	Senior Vice President of Research & Development and Chief Technology Officer	2019	Dow Inc.: Senior Vice President of Research & Development and Chief Technology Officer since April 2019. TDCC: Chief Technology Officer since October 2015; Senior Vice President of Research & Development since August 2013.
Howard Ungerleider, 53	President and Chief Financial Officer	2018	Dow Inc.: President and Chief Financial Officer since August 2018. TDCC: Chief Financial Officer since October 2014; President since July 2018; Vice Chairman from October 2015 to July 2018.
Amy E. Wilson, 51	General Counsel and Corporate Secretary	2018	Dow Inc.: General Counsel and Corporate Secretary since April 2019; Secretary from August 2018 to April 2019. TDCC: General Counsel since October 2018; Corporate Secretary since February 2015; Associate General Counsel from April 2017 to September 2018; Assistant General Counsel from February 2015 to April 2017; Director of the Office of the Corporate Secretary from August 2013 to October 2018.

ITEM 1A. RISK FACTORS

The factors described below represent the Company's principal risks.

CLIMATE CHANGE - RELATED RISKS

Climate Change: Climate change-related risks and uncertainties, legal or regulatory responses to climate change and failure to meet the Company's climate change commitments could negatively impact the Company's results of operations, financial condition and/or reputation.

The Company is subject to increasing climate-related risks and uncertainties, many of which are outside of its control. Climate change may result in more frequent severe weather events, potential changes in precipitation patterns and extreme variability in weather patterns, which can disrupt the operations of the Company as well as those of its customers, partners and vendors.

The transition to lower greenhouse gas emissions technology, the effects of carbon pricing and changes in public sentiment, regulations, taxes, public mandates or requirements and increases in climate-related lawsuits, insurance premiums and implementation of more robust disaster recovery and business continuity plans could increase costs to maintain or resume the Company's operations or achieve its sustainability commitments in the expected timeframes, which would negatively impact the Company's results of operations.

In 2020, the Company announced commitments to reduce its net annual greenhouse gas emissions by an additional 5 million metric tons, or 15 percent compared with its 2020 baseline, by 2030 (the 2020 baseline represents a 15 percent reduction in greenhouse gas emissions since 2005) and its intention to be carbon neutral by 2050 (Scopes 1+2+3, as defined by the Greenhouse Gas Protocol, plus product benefits). Execution and achievement of these commitments within the currently projected costs and expected timeframes are also subject to risks and uncertainties which include, but are not limited to: advancement, availability, development and affordability of technology necessary to achieve these commitments; unforeseen design, operational and technological difficulties; availability of necessary materials and components; adapting products to customer preferences and customer acceptance of sustainable supply chain solutions; changes in public sentiment and political leadership; the Company's ability to comply with changing regulations, taxes, mandates or requirements related to greenhouse gas emissions or other climate-related matters; and the pace of regional and global recovery from the pandemic caused by coronavirus disease 2019 ("COVID-19"). Given the focus on sustainable investing, if the Company fails to meet its climate change commitments within the committed timeframe and adopt policies and practices to enhance sustainability, the Company's reputation and its customer and other stakeholder relationships could be negatively impacted and it may be more difficult for the Company to compete effectively or gain access to financing on acceptable terms when needed, which would have an adverse effect on the Company's results of operations.

COVID-19 PANDEMIC - RELATED RISKS

Public Health Crisis: A public health crisis or global outbreak of disease, including the pandemic caused by COVID-19 has had, and could continue to have, a negative effect on the Company's manufacturing operations, supply chain and workforce, creating business disruptions that could continue to have a substantial negative impact on the Company's results of operations, financial condition and cash flows.

The pandemic caused by COVID-19 has impacted all geographic regions where Dow products are produced and sold. The global, regional and local spread of COVID-19, including existing and new variants, has resulted in significant global mitigation measures, including government-directed quarantines, social distancing and shelter-in-place mandates, travel restrictions and/or bans, mask and vaccination mandates, restrictions on large gatherings and restricted access to certain corporate facilities and manufacturing sites. Uncertainty with respect to the severity and duration of the COVID-19 pandemic, coupled with oil price fluctuations due in part to the global spread of COVID-19 and the continued increase in global cases, has contributed to the volatility of financial markets. While the severity and duration of the COVID-19 pandemic in key geographic regions and end-markets cannot be reasonably estimated at this time, impacts to the Company include, but are not limited to: fluctuations in the Company's stock price due to market volatility; a decrease in demand for certain Company products; price declines; reduced profitability; supply chain disruptions impeding the Company's ability to ship and/or receive product; temporary idling or permanent closure of select manufacturing facilities and/or manufacturing assets; asset impairment charges; interruptions or limitations to manufacturing operations imposed by local, state or federal governments; reduced market liquidity and increased borrowing costs; workforce absenteeism and distraction; labor shortages; customer credit concerns; increased cyber security risk and data accessibility disruptions due to remote working arrangements; workforce reductions and fluctuations in foreign currency markets. Additional risks may include, but are not limited to: shortages of key raw materials; potential impairment in the carrying value of goodwill; additional asset impairment charges; increased obligations related to the Company's pension and other

postretirement benefit plans; and tax valuation allowances. Business disruptions and market volatility resulting from the COVID-19 pandemic have had and could have a substantial negative impact on the Company's results of operations, financial condition and cash flows. The adverse impact of the COVID-19 pandemic on the Company may also have the effect of heightening many of the other risks described in this "Risk Factors" section.

MACROECONOMIC RISKS

Financial Commitments and Credit Markets: Market conditions could reduce the Company's flexibility to respond to changing business conditions or fund capital needs.

Adverse economic conditions could reduce the Company's flexibility to respond to changing business and economic conditions or to fund capital expenditures or working capital needs. The economic environment could result in a contraction in the availability of credit in the marketplace and reduce sources of liquidity for the Company. This could result in higher borrowing costs.

Global Economic Considerations: The Company operates in a global, competitive environment which gives rise to operating and market risk exposure.

The Company sells its broad range of products and services in a competitive, global environment, and competes worldwide for sales on the basis of product quality, price, technology and customer service. Increased levels of competition could result in lower prices or lower sales volume, which could have a negative impact on the Company's results of operations. Sales of the Company's products are also subject to extensive federal, state, local and foreign laws and regulations; trade agreements; import and export controls; taxes; and duties and tariffs. The imposition of additional regulations, controls, taxes and duties and tariffs or changes to bilateral and regional trade agreements could result in lower sales volume, which could negatively impact the Company's results of operations.

Economic conditions around the world, and in certain industries in which the Company does business, also impact sales price and volume. As a result, market uncertainty or an economic downturn driven by political tensions, war, terrorism, epidemics, pandemics or political instability in the geographic regions or industries in which the Company sells its products could reduce demand for these products and result in decreased sales volume, which could have a negative impact on the Company's results of operations.

In addition, volatility and disruption of financial markets could limit customers' ability to obtain adequate financing to maintain operations, which could result in a decrease in sales volume and have a negative impact on the Company's results of operations. The Company's global business operations also give rise to market risk exposure related to changes in inflation, foreign currency exchange rates, interest rates, commodity prices and other market factors such as equity prices. To manage such risks, the Company enters into hedging transactions, where deemed appropriate, pursuant to established guidelines and policies. If the Company fails to effectively manage such risks, it could have a negative impact on its results of operations.

Pension and Other Postretirement Benefits: Increased obligations and expenses related to the Company's defined benefit pension plans and other postretirement benefit plans could negatively impact its financial condition and results of operations.

The Company has defined benefit pension plans and other postretirement benefit plans (the "plans") in the United States and a number of other countries. The assets of the Company's funded plans are primarily invested in fixed income securities, equity securities of U.S. and foreign issuers and alternative investments, including investments in real estate, private equity and absolute return strategies. Changes in the market value of plan assets, investment returns, discount rates, mortality rates, regulations and the rate of increase in compensation levels may affect the funded status of the Company's plans and could cause volatility in the net periodic benefit cost, future funding requirements of the plans and the funded status of the plans. A significant increase in the Company's obligations or future funding requirements could have a negative impact on the Company's results of operations and cash flows for a particular period and on the Company's financial condition.

Supply/Demand Balance: Earnings generated by the Company's products vary based in part on the balance of supply relative to demand within the industry.

The balance of supply relative to demand within the industry may be significantly impacted by the addition of new capacity, especially for basic commodities where capacity is generally added in large increments as world-scale facilities are built. This may disrupt industry balances and result in downward pressure on prices due to the increase in supply, which could negatively impact the Company's results of operations.

LEGAL AND REGULATORY RISKS

Environmental Compliance: The costs of complying with evolving regulatory requirements could negatively impact the Company's financial results. Actual or alleged violations of environmental laws or permit requirements could result in restrictions or prohibitions on plant operations, substantial civil or criminal sanctions, as well as the assessment of strict liability and/or joint and several liability.

The Company is subject to extensive federal, state, local and foreign laws, regulations, rules and ordinances relating to pollution, protection of the environment, climate change, greenhouse gas emissions, and the generation, storage, handling, transportation, treatment, disposal and remediation of hazardous substances and waste materials. In addition, the Company may have costs related to environmental remediation and restoration obligations associated with past and current sites as well as related to its past or current waste disposal practices or other hazardous materials handling. Although management will estimate and accrue liabilities for these obligations, it is reasonably possible that the Company's ultimate cost with respect to these matters could be significantly higher, which could negatively impact the Company's financial condition and results of operations. Costs and capital expenditures relating to environmental, health or safety matters are subject to evolving regulatory requirements and depend on the timing of the promulgation and enforcement of specific standards which impose the requirements. Moreover, changes in environmental regulations could inhibit or interrupt the Company's operations, or require modifications to its facilities. Accordingly, environmental, health or safety regulatory matters could result in significant unanticipated costs or liabilities. For additional information, see Part II, Item 7. Other Matters, Environmental Matters in Management's Discussion and Analysis of Financial Condition and Results of Operations.

Health and Safety: Increased concerns regarding the safe use of chemicals and plastics in commerce and their potential impact on the environment has resulted in more restrictive regulations and could lead to new regulations.

Concerns regarding the safe use of chemicals and plastics in commerce and their potential impact on health and the environment reflect a growing trend in societal demands for increasing levels of product safety and environmental protection. These concerns could manifest themselves in stockholder proposals, preferred purchasing, delays or failures in obtaining or retaining regulatory approvals, delayed product launches, lack of market acceptance and continued pressure for more stringent regulatory intervention and litigation. These concerns could also influence public perceptions, the viability or continued sales of certain of the Company's products, its reputation and the cost to comply with regulations. In addition, terrorist attacks and natural disasters have increased concerns about the security and safety of chemical production and distribution. These concerns could have a negative impact on the Company's results of operations.

Local, state, federal and foreign governments continue to propose new regulations related to the security of chemical plant locations and the transportation of hazardous chemicals, which could result in higher operating costs.

Litigation: The Company is party to a number of claims and lawsuits arising out of the normal course of business with respect to product liability, patent infringement, employment matters, governmental tax and regulation disputes, contract and commercial litigation, and other actions.

Certain of the claims and lawsuits facing the Company purport to be class actions and seek damages in very large amounts. All such claims are contested. With the exception of the possible effect of the asbestos-related liability of Union Carbide Corporation ("Union Carbide") and Chapter 11 related matters of Dow Silicones Corporation ("Dow Silicones") as described below, it is the opinion of the Company's management that the possibility is remote that the aggregate of all such claims and lawsuits will have a material adverse impact on the Company's consolidated financial statements.

Union Carbide is and has been involved in a large number of asbestos-related suits filed primarily in state courts during the past four decades. At December 31, 2021, Union Carbide's total asbestos-related liability, including future defense and processing costs, was \$1,016 million (\$1,098 million at December 31, 2020).

In 1995, Dow Silicones, a former 50:50 joint venture, voluntarily filed for protection under Chapter 11 of the U.S. Bankruptcy Code in order to resolve breast implant liabilities and related matters (the "Chapter 11 Proceeding"). Dow Silicones emerged from the Chapter 11 Proceeding on June 1, 2004, and is implementing the Joint Plan of Reorganization (the "Plan"). The Plan provides funding for the resolution of breast implant and other product liability litigation covered by the Chapter 11 Proceeding. Dow Silicones' liability for breast implant and other product liability claims was \$130 million at December 31, 2021 (\$160 million at December 31, 2020). See Note 16 to the Consolidated Financial Statements for additional information on litigation matters.

Plastic Waste: Increased concerns regarding plastic waste in the environment, consumers selectively reducing their consumption of plastic products, a lack of plastic waste collection and recycling infrastructure, or new or more restrictive regulations and rules related to plastic waste could reduce demand for the Company's plastic products and could negatively impact the Company's financial results.

Local, state, federal and foreign governments have been increasingly proposing regulations to address the global plastic waste challenge, including, but not limited to, extended producer responsibility fees, a Global Plastics Treaty and bans on non-essential items. These regulations on plastic waste drive demand toward plastic solutions that are recyclable, reusable, made with recycled content and/or renewable raw materials. In addition, without proper waste collection and recycling infrastructure at scale, plastics have faced increased public scrutiny due to negative coverage of plastic waste in the environment, including the world's oceans and rivers. As Dow is one of the world's largest producers of plastics, increased pressure on the use of plastics, despite positive carbon benefits and essential functions such as food preservation and medical uses, could cause reduced demand for the Company's polyethylene products which could negatively impact the Company's financial condition, results of operations and cash flows.

OPERATIONAL AND STRATEGIC RISKS

Company Strategy: Implementing certain elements of the Company's strategy could negatively impact its financial results.

The Company currently has manufacturing operations, sales and marketing activities, and joint ventures in emerging geographic regions. Activities in these geographic regions are accompanied by uncertainty and risks including: navigating different government regulatory environments; relationships with new, local partners; project funding commitments and guarantees; expropriation, military actions, war, terrorism and political instability; sabotage; uninsurable risks; suppliers not performing as expected resulting in increased risk of extended project timelines; and determining raw material supply and other details regarding product movement. In addition, disruptions to supply chains, distribution chains and/or public and private infrastructure, including those caused by industry capacity constraints, material availability, global logistics delays and constraints arising from, among other things, the transportation capacity of ocean shipping containers and labor availability constraints, could materially and adversely impact our business operations. If the manufacturing operations, supply chains, sales and marketing activities, and/or implementation of these projects is not successful, it could adversely affect the Company's financial condition, cash flows and results of operations.

Cyber Threat: The risk of loss of the Company's trade secrets, know-how or other sensitive business information or disruption of operations could negatively impact the Company's financial results.

Cyber-attacks or security breaches could compromise confidential, business critical information, cause a disruption in the Company's operations or harm the Company's reputation. The Company has attractive information assets, including trade secrets, know-how and other sensitive, business critical information. While the Company has a comprehensive cyber-security program that is continuously reviewed, maintained and upgraded, a significant cyber-attack could result in the loss of critical business information and/or could negatively impact operations, which could have a negative impact on the Company's financial results.

Goodwill: An impairment of goodwill could negatively impact the Company's financial results.

At least annually, the Company assesses goodwill for impairment. If testing indicates that goodwill is impaired, the carrying value is written down based on fair value with a charge against earnings. Where the Company utilizes a discounted cash flow methodology in determining fair value, continued weak demand for a specific product line or business could result in an impairment. Accordingly, any determination requiring the write-off of a significant portion of goodwill could negatively impact the Company's results of operations. See Note 13 to the Consolidated Financial Statements for additional information regarding the Company's goodwill impairment testing.

Operational Event: A significant operational event could negatively impact the Company's results of operations.

As a diversified chemical manufacturing company, the Company's operations, the transportation of products, cyber-attacks, pandemics and other public health-related events or severe weather conditions and other natural phenomena (such as freezing, drought, hurricanes, earthquakes, tsunamis, floods, etc.) could result in an unplanned event that could be significant in scale and could negatively impact operations, neighbors or the public at large, which could have a negative impact on the Company's results of operations.

Major hurricanes and other weather-related events have caused significant disruption in the Company's operations on the U.S. Gulf Coast, logistics across the region, and the supply of certain raw materials, which had an adverse impact on volume and cost for some of its products. Due to the Company's substantial presence on the U.S. Gulf Coast, similar severe weather conditions or other natural phenomena in the future could negatively impact the Company's results of operations.

Raw Materials: Availability of purchased feedstock and energy, and the volatility of these costs, impact Dow's operating costs and add variability to earnings.

Purchased feedstock and energy costs account for a substantial portion of the Company's total production costs and operating expenses. The Company purchases hydrocarbon raw materials including ethane, propane, butane, naphtha and condensate as feedstocks and also purchases certain monomers, primarily ethylene and propylene, to supplement internal production, as well as other raw materials. The Company also purchases natural gas, primarily to generate electricity, and purchases electric power to supplement internal generation.

Feedstock and energy costs generally follow price trends in crude oil and natural gas, which are sometimes volatile. While the Company uses its feedstock flexibility and financial and physical hedging programs to help mitigate feedstock cost increases, the Company is not always able to immediately raise selling prices. Ultimately, the ability to pass on underlying cost increases is dependent on market conditions. Conversely, when feedstock and energy costs decline, selling prices generally decline as well. As a result, volatility in these costs could impact the Company's results of operations.

The Company has a number of investments on the U.S. Gulf Coast to take advantage of increasing supplies of low-cost natural gas and natural gas liquids ("NGLs") derived from shale gas including: the St. Charles Operations ("SCO-2") ethylene production facility, which commenced operations in December 2012; an on-purpose propylene production facility, which commenced operations in December 2015; an ethylene production facility in Plaquemine, Louisiana, which included expanding the facility's ethylene production capacity and modifications to enable full ethane cracking flexibility; completion of a new integrated world-scale ethylene production facility and a new ELITE™ Enhanced Polyethylene production facility, both located in Freeport, Texas, in 2017, and a capacity expansion project which brought the facility's total ethylene capacity to 2,000 kilotonnes per annum in 2020; and, the Company commenced operations in 2018 on its new LDPE production facility and its new NORDEL™ Metallocene EPDM production facility, both located in Plaquemine, Louisiana. As a result of these investments, the Company's exposure to purchased ethylene and propylene is expected to decline, offset by increased exposure to ethane- and propane-based feedstocks.

While the Company expects abundant and cost-advantaged supplies of NGLs in the United States to persist for the foreseeable future, if NGLs become significantly less advantaged than crude oil-based feedstocks, it could have a negative impact on the Company's results of operations and future investments. Also, if the Company's key suppliers of feedstock and energy are unable to provide the raw materials required for production, it could have a negative impact on the Company's results of operations.

Separation from DowDuPont: Risks related to achieving the anticipated benefits of Dow's separation from DowDuPont.

Risks related to achieving the anticipated benefits of Dow's separation from DowDuPont include, but are not limited to, a number of conditions outside the control of Dow, including risks related to: (i) Dow's failure to achieve in full the anticipated benefits from the separation from DowDuPont; (ii) certain tax risks associated with the separation; (iii) the failure of Dow's pro forma financial information to be a reliable indicator of Dow's future results; (iv) receipt of less favorable terms in the commercial agreements Dow entered into with DuPont and Corteva, Inc. ("Corteva"), including restrictions under intellectual property cross-license agreements, than Dow would have received from an unaffiliated third party; and (v) Dow's obligation to indemnify DuPont and/or Corteva for certain liabilities.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

The Company's corporate headquarters are located in Midland, Michigan. The Company's manufacturing, processing, marketing and research and development facilities, as well as regional purchasing offices and distribution centers are located throughout the world. The Company has investments in property, plant and equipment related to global manufacturing operations. Collectively, the Company operates 104 manufacturing sites in 31 countries. The following table includes the major manufacturing sites by operating segment, including consolidated variable interest entities:

Major Manufacturing Sites by Segment			
<i>Location</i>	<i>Packaging & Specialty Plastics</i>	<i>Industrial Intermediates & Infrastructure</i>	<i>Performance Materials & Coatings</i>
Bahia Blanca, Argentina	X		
Candeias, Brazil	X	X	
Canada:			
Fort Saskatchewan, Alberta	X		
Prentiss, Alberta	X		
Zhangjiagang, China	X	X	X
Germany:			
Boehlen	X	X	
Leuna	X		
Schkopau	X	X	
Stade		X	
Terneuzen, The Netherlands	X	X	
Tarragona, Spain	X	X	
Map Ta Phut, Thailand		X	X
Barry, United Kingdom			X
United States:			
Carrollton, Kentucky			X
Hahnville, Louisiana	X	X	X
Plaquemine, Louisiana	X	X	
Midland, Michigan			X
Deer Park, Texas		X	X
Freeport, Texas	X	X	X
Orange, Texas	X		
Seadrift, Texas	X	X	
Texas City, Texas		X	X

Including the major manufacturing sites, the Company has manufacturing sites and holdings in all geographic regions as follows:

Manufacturing Sites by Region	
Asia Pacific	18 manufacturing sites in 10 countries
EMEA ¹	37 manufacturing sites in 15 countries
Latin America	15 manufacturing sites in 4 countries
U.S. & Canada	34 manufacturing sites in 2 countries

1. Europe, Middle East, Africa and India.

Properties of the Company include facilities which, in the opinion of management, are suitable and adequate for their use and will have sufficient capacity for the Company's current needs and expected near-term growth. All of the Company's plants are owned or leased, subject to certain easements of other persons which, in the opinion of management, do not substantially interfere with the continued use of such properties or materially affect their value. No title examination of the properties has been made for the purpose of this report. Additional information with respect to the Company's property, plant and equipment and leases is contained in Notes 11, 15 and 17 to the Consolidated Financial Statements.

ITEM 3. LEGAL PROCEEDINGS

Asbestos-Related Matters of Union Carbide Corporation

Union Carbide Corporation ("Union Carbide"), a wholly owned subsidiary of the Company, is and has been involved in a large number of asbestos-related suits filed primarily in state courts during the past four decades. These suits principally allege personal injury resulting from exposure to asbestos-containing products and frequently seek both actual and punitive damages. The alleged claims primarily relate to products that Union Carbide sold in the past, alleged exposure to asbestos-containing products located on Union Carbide's premises, and Union Carbide's responsibility for asbestos suits filed against a former Union Carbide subsidiary, Amchem Products, Inc.

For additional information, see Part II, Item 7. Other Matters, Asbestos-Related Matters of Union Carbide Corporation in Management's Discussion and Analysis of Financial Condition and Results of Operations, and Notes 1 and 16 to the Consolidated Financial Statements.

Environmental Proceedings

On August 27, 2019, the U.S. Environmental Protection Agency ("EPA"), U.S. Department of Justice, Texas Environmental Quality Board, and Texas Office of the Attorney General (collectively, the "Government Agencies") added Performance Materials NA, Inc., a wholly owned subsidiary of the Company, as an additional signatory to an existing draft consent decree relating to alleged environmental violations at the Sabine olefins manufacturing facility in Orange, Texas (the "Orange, TX Facility"). Performance Materials NA, Inc. acquired the Orange, TX Facility in February 2019 and became a subsidiary of the Company in April 2019. The alleged violations were first identified during multimedia environmental inspections that the EPA conducted at the Orange, TX Facility while under prior ownership in March 2009 and December 2015, and involve the management of materials in the Orange, TX Facility's wastewater treatment system, hazardous waste management, and air emissions, including leak detection and repair. The Government Agencies filed a proposed final consent decree in the U.S. District Court for the Eastern District of Texas on October 13, 2021. On January 27, 2022, the Government Agencies filed a motion asking the court to approve, sign and enter a modified consent decree that reflects the recent merger of Performance Materials NA, Inc. with and into the Company. On January 28, 2022, the modified consent decree was approved by the court and became effective.

On May 17, 2021, the Company received a civil complaint from the State of Texas ("State") on behalf of the Texas Commission on Environmental Quality. The complaint, filed in the 250th District Court of Travis County, Texas, alleges environmental violations at the Company's Freeport, Texas, site involving 12 discrete air emissions events. The State is seeking monetary relief of no more than \$1 million and injunctive relief to prevent recurrence. On August 31, 2021, the State informed the Company that it would be including additional air emissions events in the complaint, which may impact the monetary relief sought by the State.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries
PART II

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

On April 1, 2019, DowDuPont Inc. ("DowDuPont" and effective June 3, 2019, n/k/a DuPont de Nemours, Inc.) completed the separation of its materials science business and Dow Inc. became the direct parent company of The Dow Chemical Company and its consolidated subsidiaries ("TDCC" and together with Dow Inc., "Dow" or the "Company"), owning all of the outstanding common shares of TDCC. Dow Inc. is now an independent, publicly traded company and Dow Inc. common stock is listed on the New York Stock Exchange under the symbol "DOW." Dow Inc. common stock began regular-way trading on April 2, 2019.

Dow Inc. has paid dividends on a quarterly basis since the separation from DowDuPont and expects to continue to do so, subject to approval by the Company's Board of Directors. Additional dividend information can be found in Note 18 to the Consolidated Financial Statements and Liquidity and Capital Resources in Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations.

At January 31, 2022, there were 71,615 stockholders of record.

See Part III, Item 11. Executive Compensation for information relating to shares authorized for issuance under Dow Inc.'s equity compensation plans.

The Company grants stock-based compensation to employees and non-employee directors under stock incentive plans, in the form of stock options, stock appreciation rights, performance stock units and restricted stock units. See Note 21 to the Consolidated Financial Statements for additional information.

Issuer Purchases of Equity Securities

The following table provides information regarding purchases of Dow Inc. common stock by the Company during the three months ended December 31, 2021. The Company makes such purchases only during open windows subject to its insider trading policy.

Issuer Purchases of Equity Securities			<i>Total number of shares purchased as part of the Company's publicly announced share repurchase program</i>	<i>Approximate dollar value of shares that may yet be purchased under the Company's publicly announced share repurchase program ¹ (In millions)</i>
<i>Period</i>	<i>Total number of shares purchased</i>	<i>Average price paid per share</i>		
October 2021	1,233,370	\$ 58.37	1,233,370	\$ 1,703
November 2021	5,615,034	\$ 58.42	5,615,034	\$ 1,375
December 2021	—	\$ —	—	\$ 1,375
Fourth quarter 2021	6,848,404	\$ 58.41	6,848,404	\$ 1,375

1. On April 1, 2019, Dow Inc.'s Board of Directors ratified the share repurchase program originally approved on March 15, 2019, authorizing up to \$3.0 billion to be spent on the repurchase of the Company's common stock, with no expiration date.

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

On April 1, 2019, DowDuPont Inc. ("DowDuPont" and effective June 3, 2019, n/k/a DuPont de Nemours, Inc. or "DuPont") completed the separation of its materials science business and Dow Inc. became the direct parent company of The Dow Chemical Company and its consolidated subsidiaries ("TDCC" and together with Dow Inc., "Dow" or the "Company"), owning all of the outstanding common shares of TDCC. For filings related to the period commencing April 1, 2019 and thereafter, TDCC was deemed the predecessor to Dow Inc., and the historical results of TDCC are deemed the historical results of Dow Inc. for periods prior to and including March 31, 2019. As a result of the parent/subsidiary relationship between Dow Inc. and TDCC, and considering that the financial statements and disclosures of each company are substantially similar, the companies are filing a combined report for this Annual Report on Form 10-K. The information reflected in the report is equally applicable to both Dow Inc. and TDCC, except where otherwise noted.

The separation was contemplated by the merger of equals transaction effective August 31, 2017, under the Agreement and Plan of Merger, dated as of December 11, 2015, as amended on March 31, 2017. TDCC and E. I. du Pont de Nemours and Company and its consolidated subsidiaries ("Historical DuPont") each merged with subsidiaries of DowDuPont and, as a result, TDCC and Historical DuPont became subsidiaries of DowDuPont (the "Merger"). Subsequent to the Merger, TDCC and Historical DuPont engaged in a series of internal reorganization and realignment steps to realign their businesses into three subgroups: agriculture, materials science and specialty products. Dow Inc. was formed as a wholly owned subsidiary of DowDuPont to serve as the holding company for the materials science business.

As of the effective date and time of the distribution, DowDuPont did not beneficially own any equity interest in Dow and no longer consolidated Dow and its consolidated subsidiaries into its financial results. The consolidated financial results of Dow for the applicable periods presented reflect the distribution of TDCC's agricultural sciences business ("AgCo") and specialty products business ("SpecCo") as discontinued operations, as well as reflect the receipt of Historical DuPont's ethylene and ethylene copolymers businesses (other than its ethylene acrylic elastomers business) ("ECP") as a common control transaction from the closing of the Merger on August 31, 2017 ("Merger Date"). See Note 3 to the Consolidated Financial Statements and Dow Inc.'s Amendment No. 4 to the Registration Statement on Form 10 filed with the U.S. Securities and Exchange Commission ("SEC") on March 8, 2019 for additional information.

Throughout this Annual Report on Form 10-K, unless otherwise indicated, amounts and activity are presented on a continuing operations basis.

Except as otherwise indicated by the context, the term "Union Carbide" means Union Carbide Corporation and the term "Dow Silicones" means Dow Silicones Corporation, both wholly owned subsidiaries of the Company.

Items Affecting Comparability of Financial Results

As a result of the separation from DowDuPont, pro forma net sales and pro forma Operating EBIT for the year ended December 31, 2019 are provided in this section and based on the consolidated financial statements of TDCC, adjusted to give effect to the separation from DowDuPont as if it had been consummated on January 1, 2017. Pro forma adjustments include (1) the margin impact of various manufacturing, supply and service related agreements entered into with DuPont and Corteva, Inc. ("Corteva") in connection with the separation which provide for different pricing than the historical intercompany and intracompany pricing practices of TDCC and Historical DuPont, and (2) the elimination of the impact of events directly attributable to the Merger, internal reorganization and business realignment, separation, distribution and other related transactions (e.g., one-time transaction costs). These adjustments impacted the consolidated results as well as the reportable segments. See Note 26 to the Consolidated Financial Statements for a summary of the pro forma adjustments impacting segment measures for the year ended December 31, 2019.

STATEMENT ON COVID-19 AND U.S. GULF COAST FREEZE

COVID-19

The pandemic caused by coronavirus disease 2019 ("COVID-19") has impacted all geographic regions where Dow products are produced and sold. Throughout this public health crisis, the Company has been focused on the health and safety of its employees, contractors, customers and suppliers around the world and maintaining the safe and reliable operations of its manufacturing sites. Although supply disruptions and related logistics issues have posed challenges across all modes of transportation, the Company's manufacturing sites have continued to operate during the COVID-19 pandemic, with no significant impact to manufacturing whether through shutdowns or shortages in labor, raw materials or personal protective equipment. Contingency plans remain in place in the event of significant impacts from COVID-19 infection resurgences.

In January 2022, the Company opened all sites and locations to employees, where permitted by local regulations, and continues to require that several health and safety measures be followed. All regions continue to follow on-site workforce restrictions in accordance with government regulations. At the time of this filing, approximately half of Dow's global workforce is working remotely. The Company continues to encourage its workforce to practice safe behaviors in the workplace and while away from work to help prevent community spread of COVID-19.

The Company is well-positioned for continued profitable growth in the ongoing economic recovery and improving industry cycle. The Company will maintain its disciplined focus on capital allocation priorities as it benefits from an improving cost structure, financial flexibility and a low-cost operating model. Through the ongoing market recovery, Dow has experienced increasing margins as differentiated parts of the portfolio see improved demand and underlying market dynamics, which has enabled a return to pre-COVID-19 sales levels and end-market growth across most businesses.

The Company has continued to maintain a strong financial position and liquidity throughout the economic recession triggered by the COVID-19 pandemic and its ongoing recovery. At December 31, 2021, the Company had cash and committed and available forms of liquidity of \$12.6 billion. The Company also has no substantive long-term debt maturities due until 2026.

Additional information regarding the risks associated with the COVID-19 pandemic can be found in this report in Part 1, Item 1A, Risk Factors.

U.S. Gulf Coast Freeze

In the first quarter of 2021, Winter Storm Uri had a broad impact on the U.S. Gulf Coast and in particular across the entire state of Texas, which resulted in widespread utility and raw material supply disruptions and industry-wide production outages. All Dow ethylene production facilities located on the U.S. Gulf Coast were operational by March 31, 2021, along with all sites. As a result of the winter storm, the product and supply chain impacts across the industry created very tight supply dynamics and generated pricing momentum for both raw materials and finished goods. The Company remains close to its customers and continues to work diligently to meet demand needs.

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ABOUT DOW

Dow combines global breadth; asset integration and scale; focused innovation and materials science expertise; leading business positions; and environmental, social and governance (ESG) leadership to achieve profitable growth and deliver a sustainable future. The Company's ambition is to become the most innovative, customer centric, inclusive and sustainable materials science company in the world. Dow's portfolio of plastics, industrial intermediates, coatings and silicones businesses delivers a broad range of differentiated, science-based products and solutions for its customers in high-growth market segments, such as packaging, infrastructure, mobility and consumer applications. Dow operates 104 manufacturing sites in 31 countries and employs approximately 35,700 people.

In 2021, the Company had annual sales of \$55 billion, of which 36 percent of the Company's sales were to customers in the U.S. & Canada; 36 percent were in Europe, Middle East, Africa and India ("EMEA"); while the remaining 28 percent were to customers in Asia Pacific and Latin America.

In 2021, the Company and its consolidated subsidiaries did not operate in countries subject to U.S. economic sanctions and export controls as imposed by the U.S. State Department or in countries designated by the U.S. State Department as state sponsors of terrorism, including Cuba, Iran, the Democratic People's Republic of Korea (North Korea), Sudan and Syria. The Company has policies and procedures in place designed to ensure that it and its consolidated subsidiaries remain in compliance with applicable U.S. laws and regulations.

OVERVIEW

The following is a summary of the results from continuing operations for the Company for the year ended December 31, 2021:

The Company reported net sales in 2021 of \$55 billion, up 43 percent from \$38.5 billion in 2020, with increases across all geographic regions and operating segments, driven by an increase in local price of 40 percent, a volume increase of 1 percent and a favorable currency impact of 2 percent.

Local price increased 40 percent compared with the same period last year, with increases in all operating segments and geographic regions, primarily reflecting price gains due to tight supply and demand dynamics. Local price increased in Packaging & Specialty Plastics (up 50 percent), Industrial Intermediates & Infrastructure (up 40 percent) and Performance Materials & Coatings (up 19 percent).

Volume increased 1 percent compared with 2020, with increases in Packaging & Specialty Plastics (up 2 percent) and Performance Materials & Coatings (up 1 percent), partially offset by a decrease in Industrial Intermediates & Infrastructure (down 2 percent). Volume increased in the U.S. & Canada (up 2 percent) and in EMEA (up 3 percent), partially offset by decreases in Asia Pacific (down 4 percent) and Latin America (down 3 percent).

Currency had a favorable impact of 2 percent on net sales compared with 2020, driven by EMEAI (up 4 percent) and Asia Pacific (up 2 percent).

Restructuring and asset related charges - net were \$6 million in 2021, compared with \$708 million in 2020, primarily reflecting actions taken under the 2020 Restructuring Program.

Equity in earnings of nonconsolidated affiliates was \$975 million in 2021, compared with equity losses of \$18 million in 2020, primarily driven by margin expansion at Sadara Chemical Company ("Sadara") and the Kuwait and Thai joint ventures.

Sundry income (expense) - net for Dow Inc. and TDCC was expense of \$35 million and \$79 million, respectively, in 2021, compared with income of \$1,269 million and \$1,274 million, respectively, in 2020. Sundry income (expense) - net decreased primarily due to losses on the early extinguishment of debt in the current year, compared with gains related to a legal matter, the sale of certain marine and terminal operations and the sale of certain rail infrastructure operations and assets, which were partially offset by losses on the early extinguishment of debt in the prior year.

Net income available for Dow Inc. and TDCC common stockholder(s) was \$6,311 million and \$6,274 million, respectively, in 2021, compared with \$1,225 million and \$1,235 million, respectively, in 2020. Earnings per share for Dow Inc. was \$8.38 per share in 2021, compared with \$1.64 per share in 2020.

In 2021, TDCC redeemed more than \$1 billion of certain notes due in 2024 and completed cash tender offers resulting in over \$1 billion of aggregate principal amount of certain notes being tendered and retired. The Company's proactive liability management actions to tender and redeem existing notes have resulted in no substantive long-term debt maturities due until 2026.

In 2021, the Company executed strategic buy-outs of certain leased assets for approximately \$690 million.

In 2021, Dow Inc. declared and paid dividends to common stockholders of \$2.80 per share (\$2,073 million).

In 2021, Dow Inc. repurchased \$1,000 million of the Company's common stock.

Other notable events and highlights from the year ended December 31, 2021 include:

- Dow received three 2021 BIG Innovation Awards from the Business Intelligence Group for DOWSIL™ TC-3065 Thermally Conductive Gel; DOWSIL™ 993N Structural Glazing Sealant and Catalyst; and the world's first commercial polyurethane-carbon fiber spar cap for the new generation of wind blades.
- Dow was named to Bloomberg's 2021 Gender-Equality Index.
- Dow was named by the Human Rights Campaign ("HRC") Foundation to its 2021 list of "Best Places to Work for LGBTQ+ Equality." This marks the Company's sixteenth consecutive year receiving a perfect score on HRC's Corporate Equality Index.
- On March 4, 2021, TDCC announced changes to the design of its U.S. tax-qualified and non-qualified retirement programs. Separately, TDCC elected to contribute \$1 billion to its U.S. tax-qualified pension plans.
- Dow was recognized with three Manufacturing Leadership Awards by the Manufacturing Leadership Council, a division of the National Association of Manufacturers. Dow's Manufacturing 4.0 received the Enterprise Integration and Technology Award, the E2E Business Planning Program was awarded the Supply Chain Award, and Accelerating Innovation in Instrumentation & Sensors at Dow Texas Operations received the Industrial Internet of Things Award.
- Dow received a 2021 CIO 100 award from IDG's CIO for the digitalization of its end-to-end business planning platform.
- On March 25, 2021, Dow Inc. (together with Sadara and the Saudi Arabian Oil Company) completed a debt re-profiling agreement for Sadara with agency creditors and commercial lenders. The re-profiled debt repayment schedule is better aligned to match Sadara's expected future cash flow generation.
- Dow received two 2021 Ringier Technology Innovation Awards in the Plastics Raw Materials & Additives category including: Post-Consumer Recycled resin XUS60921.01 and Carpet tile with INFUSE™ polyolefin backing.

- Dow was named as one of the 2021 Fortune 100 Best Companies to Work For®; as well as, being recognized by Great Place to Work® in several other countries around the world including: 2021 Best Workplaces™ in Argentina, Colombia and Saudi Arabia.
- On April 13, 2021, Fitch Ratings ("Fitch") reaffirmed TDCC's BBB+ and F2 rating, and revised its outlook to stable from negative. The decision was made as part of Fitch's annual review process.
- Effective April 15, 2021, following the Company's Annual Meeting of Stockholders ("2021 Meeting") Dow Inc.'s Board elected Richard K. Davis to serve as Lead Director until the 2022 Annual Meeting of Stockholders. The Company also announced that Debra L. Dial, senior vice president and controller at AT&T Inc., and Luis Alberto Moreno, managing director at Allen & Co, LLC and former president of Inter-American Development Bank Group, were elected to the Board at the 2021 Meeting. Ajay Banga, Jacqueline K. Barton and James A. Bell retired from the Board following the 2021 Meeting as announced on February 11, 2021.
- On April 21, 2021, Dow received a 2021 FutureEdge 50 award for its Predictive Intelligence capability, Dow Polyurethanes' flagship digitalization initiative. The FutureEdge 50 awards annually recognize 50 organizations pushing the edge of innovation with breakthrough technologies to advance their business for the future.
- Dow received 20 American Chemistry Council Responsible Care® awards for exemplary environmental, health and safety performance. Dow received awards for site safety, minimizing waste, improving energy efficiency, and its COVID-19 response.
- Dow received six 2021 Edison Awards, including five Gold Edison Awards, for breakthrough technologies including: DOWSIL™ CC-8030 UV and Moisture Dual Cure Conformal Coating; DOWSIL™ TC-5515LT Thermally Conductive Gap Filler; DOWSIL™ TC-3065 Thermal Conductive Silicone Gel for 5G Optical Access Infrastructure; DOWSIL™ VE-8001 Flexible Silicone Adhesive by Dow; RHOBARR™ 320 Polyolefin Dispersion; and DOWSIL™ Crystal Clear Spacer. Dow is the first company to receive five Gold Edison Awards in a single year.
- Dow was named to the 2021 DiversityInc Top 50 Companies for Diversity list for the fourth consecutive year. Dow was also included on three of DiversityInc's Specialty Lists including: Top Companies for Employee Resource Groups, Top Companies for People with Disabilities, and Top Companies for ESG.
- Dow was named 2021 Manufacturer of the Year, Large Enterprise, by the Manufacturing Leadership Council, a division of the National Association of Manufacturers. The Manufacturer of the Year Award is given to the company that shows best-in-class achievement.
- On June 10, 2021, Standard & Poor's ("S&P") announced a credit rating upgrade for TDCC from BBB- and A-3 to BBB and A-2, maintaining stable outlook. The decision from S&P reflects the expectation for an ongoing macroeconomic recovery, the Company's supportive financial policies and the strengthening of its operating performance in 2021 relative to 2020.
- Dow was named a 2021 honoree and the Materials Sector leader of The Civic 50 by Points of Light, the world's largest organization committed to inspiring, equipping and engaging people to take action to change their communities and the world.
- On June 24, 2021, Dow Inc. released "INtersections," its first consolidated Environmental, Social and Governance ("ESG") Report highlighting the Company's significant progress to fully integrate environmental stewardship and positive social impact throughout its operations, teams, supply chain and communities. This marked Dow's eighteenth year of voluntary reporting on sustainability.
- For the fifth consecutive year, Dow has received a top score on the *Disability Equality Index*®, placing the Company among the "Best Places to Work for Disability Inclusion" for 2021.
- Dow received the "Best in Enterprise Resilience" certification from Everbridge as a part of their Critical Event Management (CEM) Certification™ Program. This recognition demonstrates Dow's commitment to implementing best practices for enterprise resilience that keep employees safe and the company running safely, reliably and efficiently.
- Dow was named to Seramount's 2021 Inclusion Index (formerly known as the Diversity Best Practices Inclusion Index). This is the first year Dow was recognized on the list which includes a total of 45 organizations recognized for creating an inclusive workplace.
- Dow was named one of the "2021 PEOPLE Companies that Care®" for the second consecutive year.

- Great Place to Work® and Fortune magazine have named Dow one of the 2021 Best Workplaces in Manufacturing & Production™. This is the first time Dow was named to this prestigious list, ranking third on the list.
- Dow won two Sustainability Product of the Year awards in the 2021 Sustainability Awards program of Business Intelligence Group for SPECFLEX™ Microcellular Polyurethane and SYNTEGRA™ Polyurethane Dispersions for Microfiber.
- On October 6, 2021, Dow Inc. held an Investor Day event where it announced the following: investment plans to deliver more than \$3 billion of additional underlying EBITDA growth with a clear path to zero-carbon emissions (with respect to Scope 1, 2 and 3 carbon emissions, including offsets from product benefits and technology advancements); new renewable and cleaner power agreements which are expected to reduce Dow's Scope 2 emissions by more than 600,000 metric tons of carbon dioxide equivalent per year; a plan to build the world's first net-zero carbon emissions (with respect to Scope 1 and 2 carbon dioxide emissions, including technology advancements) ethylene and derivatives complex; and expansion of global capabilities for circular plastics, with initial products available for customers in 2022.
- Dow earned multiple Critical Guidance Recognitions for recyclability from the Association of Plastic Recyclers ("APR"), in three product categories. ROBOND™ Adhesives, OPULUX™ Optical Finishes and SURLYN™ Ionomers were each recognized by APR for solving packaging design challenges.
- Dow received two *R&D 100 Awards* from *R&D Magazine* for innovative technologies including: DOWSIL™ TC-4060 Thermal Gel and Multi-functional Sorbent Technology ("MUST").
- Five additional Dow sites received International Sustainability & Carbon Certification PLUS recognition for their compliance with rigorous tracking of sustainable feedstocks use.
- DOWSIL™ TC-4060 Thermal Gel was awarded Best Product Innovation and SunSpheres™ BIO SPF Booster was awarded Product with Best Benefit to the Environment and Sustainability from Innovation Commodity Intelligence Services.
- In 2021, CDP (formerly Carbon Disclosure Project, an international non-profit specialized in environmental reporting) improved Dow's climate change score to an A- from a B.

In addition to the highlights above, the following events occurred subsequent to December 31, 2021:

- For the third year, Dow was named to the JUST 100 list. Dow earned the top spot in the Chemicals sector overall and received the number one position in the Workers and Stakeholders & Governance categories versus industry peers.
- Dow received three 2021 BIG Innovation Awards from the Business Intelligence Group for DOWSIL™ TC-2035 CV Adhesive, DOWSIL™ TC-6015 Thermally Conductive Encapsulant and UCARE™ Extreme Polymer.
- Dow was named to Bloomberg's 2022 Gender-Equality Index for the second consecutive year.
- Dow was named by the Human Rights Campaign ("HRC") Foundation to its 2022 list of "Best Places to Work for LGBTQ+ Equality." This marks the Company's seventeenth consecutive year receiving a perfect score on HRC's Corporate Equality Index.

RESULTS OF OPERATIONS

Net Sales

The following tables summarize net sales, pro forma net sales and sales variance by operating segment and geographic region from the prior year:

Summary of Sales Results	<i>2021</i>	<i>2020</i>	<i>2019</i>
In millions			
Net sales	\$ 54,968	\$ 38,542	\$ 42,951
Pro forma net sales			\$ 42,998

Sales Variances by Operating Segment and Geographic Region - As Reported

Percentage change from prior year	2021				2020				
	Local Price & Product Mix	Currency	Volume	Total	Local Price & Product Mix	Currency	Volume	Portfolio & Other ¹	Total
Packaging & Specialty Plastics	50 %	2 %	2 %	54 %	(11) %	— %	1 %	— %	(10) %
Industrial Intermediates & Infrastructure	40	2	(2)	40	(5)	—	(6)	—	(11)
Performance Materials & Coatings	19	2	1	22	(6)	—	(6)	1	(11)
Total	40 %	2 %	1 %	43 %	(7) %	— %	(3) %	— %	(10) %
Total, excluding the Hydrocarbons & Energy business	37 %	2 %	(2) %	37 %	(5) %	— %	(4) %	— %	(9) %
U.S. & Canada	42 %	— %	2 %	44 %	(5) %	— %	(8) %	— %	(13) %
EMEA	45	4	3	52	(12)	—	1	—	(11)
Asia Pacific	25	2	(4)	23	(6)	—	—	—	(6)
Latin America	48	—	(3)	45	(7)	—	—	—	(7)
Total	40 %	2 %	1 %	43 %	(7) %	— %	(3) %	— %	(10) %

1. Portfolio & Other includes the sales impact of various manufacturing, supply and service related agreements entered into with DuPont and Corteva in connection with the separation, which provide for different pricing than the historical intercompany and intracompany pricing practices of TDCC and Historical DuPont.

Sales Variances by Operating Segment and Geographic Region - As Reported

Percentage change from prior year	2019				
	Local Price & Product Mix	Currency	Volume	Portfolio & Other ¹	Total
Packaging & Specialty Plastics	(12) %	(1) %	(3) %	— %	(16) %
Industrial Intermediates & Infrastructure	(12)	(1)	—	—	(13)
Performance Materials & Coatings	(6)	(2)	(3)	3	(8)
Total	(11) %	(1) %	(2) %	1 %	(13) %
Total, excluding the Hydrocarbons & Energy business	(11) %	(2) %	1 %	1 %	(11) %
U.S. & Canada	(11) %	— %	(3) %	1 %	(13) %
EMEA	(9)	(3)	(4)	—	(16)
Asia Pacific	(12)	(1)	5	—	(8)
Latin America	(14)	—	(3)	—	(17)
Total	(11) %	(1) %	(2) %	1 %	(13) %

1. Portfolio & Other includes the sales impact of various manufacturing, supply and service related agreements entered into with DuPont and Corteva in connection with the separation, which provide for different pricing than the historical intercompany and intracompany pricing practices of TDCC and Historical DuPont.

2021 Versus 2020

The Company reported net sales of \$55 billion in 2021, up 43 percent from \$38.5 billion in 2020, with local price up 40 percent, a favorable currency impact of 2 percent and volume up 1 percent. Net sales increased in all operating segments and across all geographic regions. Local price increased in all operating segments and across all geographic regions, primarily reflecting price gains due to tight supply and demand dynamics driven by logistics constraints and weather events. Local price increased in Packaging & Specialty Plastics (up 50 percent), Industrial Intermediates & Infrastructure (up 40 percent) and Performance Materials & Coatings (up 19 percent). Volume increased in Packaging & Specialty Plastics (up 2 percent) and Performance Materials & Coatings (up 1 percent). Volume decreased in Industrial Intermediates & Infrastructure (down 2 percent). Excluding the Hydrocarbons & Energy business, sales increased 37 percent.

2020 Versus 2019

The Company reported net sales of \$38.5 billion in 2020, down 10 percent from \$43.0 billion in 2019, with local price down 7 percent and volume down 3 percent. Net sales decreased in all geographic regions and operating segments, reflecting impacts from the global COVID-19 pandemic on economies and supply and demand dynamics, most notably in the first half of the year. Local price decreased in all operating segments and in all geographic regions, primarily in response to lower global energy prices. Local price decreased in Packaging & Specialty Plastics (down 11 percent), Industrial Intermediates & Infrastructure (down 5 percent) and Performance Materials & Coatings (down 6 percent). Volume declined 3 percent, driven by the U.S. & Canada (down 8 percent), which was partially offset by demand growth in EMEAI (up 1 percent). Volume was flat in Asia Pacific and Latin America. Volume increased in Packaging & Specialty Plastics (up 1 percent) and decreased in Industrial Intermediates & Infrastructure and Performance Materials & Coatings (both down 6 percent). Excluding the Hydrocarbons & Energy business, sales declined 9 percent.

Sales Variances by Operating Segment and Geographic Region - Pro Forma Basis								
Percentage change from prior year	2020 ¹				2019			
	Local Price & Product Mix	Currency	Volume	Total	Local Price & Product Mix	Currency	Volume	Total
Packaging & Specialty Plastics	(11) %	— %	1 %	(10)%	(12) %	(1) %	(3) %	(16)%
Industrial Intermediates & Infrastructure	(5)	—	(6)	(11)	(12)	(2)	1	(13)
Performance Materials & Coatings	(6)	—	(5)	(11)	(6)	(2)	(1)	(9)
Total	(7) %	— %	(3) %	(10)%	(11) %	(1) %	(2) %	(14)%
Total, excluding the Hydrocarbons & Energy business	(5) %	— %	(4) %	(9)%	(10) %	(2) %	1 %	(11)%
U.S. & Canada	(5) %	— %	(8) %	(13)%	(11) %	— %	(2) %	(13)%
EMEI	(12)	—	1	(11)	(9)	(3)	(4)	(16)
Asia Pacific	(6)	—	—	(6)	(12)	(1)	5	(8)
Latin America	(7)	—	—	(7)	(15)	—	(3)	(18)
Total	(7) %	— %	(3) %	(10)%	(11) %	(1) %	(2) %	(14)%

1. As reported net sales for the year ended December 31, 2020 compared with pro forma net sales for the year ended December 31, 2019.

2020 Versus 2019 - Pro Forma

The Company reported net sales of \$38.5 billion for 2020, down 10 percent from pro forma net sales of \$43.0 billion in 2019, with local price down 7 percent and volume down 3 percent. Net sales decreased in all geographic regions and operating segments, reflecting impacts from the global COVID-19 pandemic on economies and supply and demand dynamics, most notably in the first half of the year. Local price decreased in all operating segments and in all geographic regions, primarily in response to lower global energy prices. Local price decreased in Packaging & Specialty Plastics (down 11 percent), Industrial Intermediates & Infrastructure (down 5 percent) and Performance Materials & Coatings (down 6 percent). Volume declined 3 percent, driven by the U.S. & Canada (down 8 percent), which was partially offset by an increase in EMEAI (up 1 percent). Volume was flat in Asia Pacific and Latin America. Volume increased in Packaging & Specialty Plastics (up 1 percent) and decreased in Industrial Intermediates & Infrastructure (down 6 percent) and Performance Materials & Coatings (down 5 percent). Excluding the Hydrocarbons & Energy business, sales declined 9 percent.

Cost of Sales

Cost of sales ("COS") was \$44.2 billion in 2021, compared with \$33.3 billion in 2020. COS increased in 2021 primarily due to higher feedstock and energy costs and impacts from Winter Storm Uri, which included higher raw material costs and repair costs. In 2021, COS included \$146 million of costs associated with implementing the Company's digital acceleration program (related to Corporate). COS as a percentage of sales was 80.4 percent in 2021 compared with 86.5 percent in 2020.

COS was \$33.3 billion in 2020, compared with \$36.7 billion in 2019. COS decreased in 2020 primarily due to lower feedstock and other raw material costs, decreased sales volume and lower planned maintenance turnaround costs, which were partially offset by higher performance-based compensation costs. Operating rates declined significantly in the second quarter of 2020, as the Company temporarily idled certain manufacturing facilities and selectively adjusted operating rates at other facilities to balance production to demand in response to the COVID-19 pandemic. These facilities returned to more normalized operating rates in the third quarter of 2020. Overall, operating rates increased in the third and fourth quarters of 2020. In 2019, COS also included \$75 million of transaction-related costs resulting from the separation from DowDuPont (related to Corporate) and \$399 million of environmental charges related to Packaging & Specialty Plastics (\$5 million), Industrial Intermediates & Infrastructure (\$8 million), Performance Materials & Coatings (\$50 million) and Corporate (\$336 million). COS as a percentage of sales was 86.5 percent in 2020 compared with 85.3 percent in 2019.

Research and Development Expenses

Research and development ("R&D") expenses were \$857 million in 2021, compared with \$768 million in 2020 and \$765 million in 2019. R&D expenses in 2021 increased compared with 2020 primarily due to increased performance-based compensation costs and fringe benefit expenses driven by stock market increases compared with the same period last year. R&D expenses in 2020 increased compared with 2019 primarily due to increased performance-based compensation costs which were partially offset by cost reductions.

Selling, General and Administrative Expenses

Selling, general and administrative ("SG&A") expenses were \$1,645 million in 2021, compared with \$1,471 million in 2020 and \$1,590 million and \$1,585 million for Dow Inc. and TDCC, respectively, in 2019. SG&A expenses in 2021 increased primarily due to increased performance-based compensation costs and fringe benefit expenses driven by stock market increases compared with the same period last year. SG&A expenses in 2020 decreased compared to 2019 primarily due to cost reductions which were partially offset by increased performance-based compensation costs. In 2020, SG&A was also favorably impacted by the recovery of legal costs related to the Nova Chemicals Corporation ("Nova") ethylene asset matter and the reversal of a bad debt reserve related to an arbitration judgment. See Note 16 to the Consolidated Financial Statements for additional information on the Nova litigation matters.

Amortization of Intangibles

Amortization of intangibles was \$388 million in 2021, compared with \$401 million in 2020 and \$419 million in 2019. Amortization of intangibles decreased primarily due to certain intangible assets becoming fully amortized. See Note 13 to the Consolidated Financial Statements for additional information on intangible assets.

Restructuring, Goodwill Impairment and Asset Related Charges - Net

Restructuring, goodwill impairment and asset related charges - net were \$6 million in 2021, \$708 million in 2020 and \$3,219 million in 2019.

2020 Restructuring Program

On September 29, 2020, Dow Inc.'s Board approved restructuring actions to achieve the Company's structural cost improvement initiatives in response to the continued economic impact from the COVID-19 pandemic. The restructuring program was designed to reduce structural costs and enable the Company to further enhance competitiveness while the COVID-19 economic recovery gained traction. These actions were substantially complete by the end of 2021, except for certain cash payments expected to be made in 2022.

In 2020, the Company recorded pretax restructuring charges of \$573 million, consisting of severance and related benefit costs of \$297 million, asset write-downs and write-offs of \$196 million and costs associated with exit and disposal activities of \$80 million. Restructuring charges by segment were as follows: \$11 million in Packaging & Specialty Plastics, \$22 million in Industrial Intermediates & Infrastructure, \$177 million in Performance Materials & Coatings and \$363 million in Corporate.

In 2021, the Company recorded pretax restructuring charges of \$12 million for asset write-downs and write-offs and \$10 million for costs associated with exit and disposal activities. Restructuring charges by segment were as follows: \$8 million in Packaging & Specialty Plastics, \$1 million in Industrial Intermediates & Infrastructure, \$10 million in Performance Materials & Coatings and \$3 million in Corporate. In addition, the Company reduced pretax restructuring charges by \$10 million for severance and related benefit costs, related to Corporate.

DowDuPont Cost Synergy Program

In September and November 2017, DowDuPont approved post-Merger restructuring actions under the DowDuPont Cost Synergy Program (the "Synergy Program") which was designed to integrate and optimize the organization following the Merger and in preparation for the business separations. The restructuring charges below reflect charges from continuing operations.

In 2019, the Company recorded pretax restructuring charges of \$292 million, consisting of severance and related benefit costs of \$123 million, asset write-downs and write-offs of \$143 million and costs associated with exit and disposal activities of \$26 million. Restructuring charges by segment were as follows: \$1 million in Packaging & Specialty Plastics, \$7 million in Industrial Intermediates & Infrastructure, \$28 million in Performance Materials & Coatings and \$256 million in Corporate.

In 2020, the Company recorded pretax restructuring charges of \$86 million and reduced pretax restructuring charges by \$6 million in 2021, both for severance and related benefit costs (related to Corporate). Cash expenditures related to the Synergy Program were substantially complete at December 31, 2020.

2019 Goodwill Impairment

Upon completion of the goodwill impairment testing in the fourth quarter of 2019, the Company determined the fair value of the Coatings & Performance Monomers reporting unit was lower than its carrying amount. As a result, the Company recorded an impairment charge of \$1,039 million in the fourth quarter of 2019 related to Performance Materials & Coatings.

2020 Asset Related Charges

In 2020, the Company recognized pretax impairment charges of \$49 million, including additional pretax impairment charges for capital additions made to a bio-ethanol manufacturing facility in Santa Vitoria, Minas Gerais, Brazil ("Santa Vitoria"), which was impaired in 2017 and divested in 2020, as well as charges for miscellaneous write-offs and write-downs of non-manufacturing assets and the write-down of certain corporate leased equipment. Impairment charges by segment were as follows: Packaging & Specialty Plastics (\$19 million), Performance Materials & Coatings (\$15 million) and Corporate (\$15 million). See Note 23 for additional information.

2019 Asset Related Charges

On August 13, 2019, the Company entered into a definitive agreement to sell its acetone derivatives business to ALTIVIA Ketones & Additives, LLC. The transaction closed on November 1, 2019 and included the Company's acetone derivatives related inventory and production assets, located in Institute, West Virginia, in addition to the site infrastructure, land, utilities and certain railcars. The Company remains at the Institute site as a tenant. As a result of the divestiture, the Company recognized a pretax impairment charge of \$75 million in the third quarter of 2019. The impairment charge by segment was as follows: \$24 million in Packaging & Specialty Plastics and \$51 million in Corporate.

In the fourth quarter of 2019, the Company concluded that its equity method investment in Sadara was other-than-temporarily impaired. The Company also reserved certain accounts and notes receivable and accrued interest balances due to uncertainty on the timing of collection. As a result, the Company recorded a \$1,755 million pretax charge related to Sadara. The charge by segment was as follows: \$370 million in Packaging & Specialty Plastics, \$1,168 million in Industrial Intermediates & Infrastructure and \$217 million in Corporate.

In 2019, the Company recognized additional pretax impairment charges of \$58 million related primarily to capital additions at its Santa Vitoria manufacturing facility, which was impaired in 2017. Impairment charges by segment were as follows: \$44 million in Packaging & Specialty Plastics, \$9 million in Performance Materials & Coatings and \$5 million in Corporate.

See Note 6 to the Consolidated Financial Statements for additional information on restructuring, goodwill impairment and asset related charges.

Integration and Separation Costs

Integration and separation costs, which reflect costs related to post-Merger integration and business separation activities, were \$239 million in 2020 and \$1,063 million and \$1,039 million for Dow Inc. and TDCC, respectively, in 2019. Integration and business separation activities were completed as of December 31, 2020. Integration and separation costs are related to Corporate.

Equity in Earnings (Losses) of Nonconsolidated Affiliates

The Company's share of equity in earnings of nonconsolidated affiliates was \$975 million in 2021, compared with equity losses of \$18 million in 2020 and \$94 million in 2019. The equity earnings improvement in 2021 compared with 2020 was primarily due to margin expansion at Sadara driven by broad-based price increases, strong MEG prices at the Kuwait joint ventures and improved elastomer and polyethylene margins at the Thai joint ventures. In 2020, equity losses decreased compared with 2019 primarily due to lower equity losses from Sadara, driven by improved industry supply and demand dynamics in the third and fourth quarters of 2020, which were partially offset by lower equity earnings from the Kuwait joint ventures due to lower monoethylene glycol prices. See Note 12 to the Consolidated Financial Statements for additional information on the Company's evaluation of its equity method investment in Sadara for other-than-temporary impairment in 2019.

Sundry Income (Expense) - Net

Sundry income (expense) - net includes a variety of income and expense items such as foreign currency exchange gains and losses, dividends from investments, gains and losses on sales of investments and assets, non-operating pension and other postretirement benefit plan credits or costs, losses on early extinguishment of debt and certain litigation matters.

TDCC

Sundry income (expense) - net for 2021 was expense of \$79 million, compared with income of \$1,274 million in 2020 and \$573 million in 2019.

In 2021, sundry income (expense) - net included a \$574 million loss on the early extinguishment of debt (related to Corporate and included in "Other net loss" in the consolidated statements of cash flows), and foreign currency exchange losses. These were partially offset by non-operating pension and postretirement benefit plan credits, gains on the sale of assets and investments, a \$54 million gain related to an arbitration award (related to Industrial Intermediates & Infrastructure), and a \$16 million gain related to post-closing adjustments on the previous divestiture of a bio-ethanol manufacturing facility in Brazil (related to Packaging & Specialty Plastics). See Notes 7, 15, 16, 20 and 26 to the Consolidated Financial Statements for additional information.

In 2020, sundry income (expense) - net included a \$544 million gain related to the Nova ethylene asset matter (related to Packaging & Specialty Plastics), a \$499 million gain related to the sale of certain U.S. Gulf Coast marine and terminal operations and assets (\$17 million related to Packaging & Specialty Plastics, \$61 million related to Industrial Intermediates & Infrastructure and \$421 million related to Corporate), a \$233 million gain related to the sale of rail infrastructure operations and assets in the U.S. & Canada (\$48 million related to Packaging & Specialty Plastics and \$185 million related to Corporate), and non-operating pension and postretirement benefit plan credits. These were partially offset by a \$149 million loss on the early extinguishment of debt (related to Corporate and included in "Other net loss" in the consolidated statements of cash flows), foreign currency exchange losses, \$11 million in charges associated with agreements entered into with DuPont and Corteva as part of the separation and distribution, which provides for cross-indemnities and allocations of obligations and liabilities for periods prior to, at and after completion of the separation (related to Corporate), a \$13 million loss related to the divestiture of a bio-ethanol manufacturing facility in Brazil (related to Packaging & Specialty Plastics) and a \$2 million loss on an asset sale (related to Corporate). See Notes 5, 7, 15, 16, 20 and 26 to the Consolidated Financial Statements for additional information.

In 2019, sundry income (expense) - net included foreign currency exchange gains, non-operating pension and postretirement benefit plan credits and gains on sales of assets and investments, as well as a net gain of \$205 million related to litigation matters, which included a \$170 million gain related to a legal matter with Nova (related to Packaging & Specialty Plastics), and an \$85 million gain related to an adjustment of the Dow Silicones breast implant liability (related to Corporate), which were partially offset by a \$50 million charge (net of indemnifications of \$37 million), related to the settlement of the Dow Silicones commercial creditor matters (related to Corporate). In 2019, sundry income (expense) - net also included a \$102 million loss on the early extinguishment of debt (related to Corporate and included in "Other net loss" in the consolidated statements of cash flows) and a gain of \$2 million on post-closing adjustments related to previous divestitures (related to Corporate). See Notes 7, 15, 16, 20 and 26 to the Consolidated Financial Statements for additional information.

Dow Inc.

Sundry income (expense) - net for 2021 was expense of \$35 million, compared with income of \$1,269 million in 2020 and \$461 million in 2019.

In 2021, in addition to the amounts previously discussed above for TDCC, sundry income (expense) - net included \$30 million in gains associated with the agreements entered into with DuPont and Corteva as part of the separation and distribution (related to Corporate).

In 2020, in addition to the amounts previously discussed above for TDCC, sundry income (expense) - net included \$10 million in charges associated with the agreements entered into with DuPont and Corteva as part of the separation and distribution (related to Corporate).

In 2019, in addition to the amounts previously discussed above for TDCC, sundry income (expense) - net included a \$51 million loss on post-closing adjustments related to a previous divestiture and \$69 million in charges associated with the agreements entered into with DuPont and Corteva as part of the separation and distribution (both related to Corporate). See Notes 3, 7, 15, 16, 20 and 26 to the Consolidated Financial Statements for additional information.

Interest Expense and Amortization of Debt Discount

Interest expense and amortization of debt discount was \$731 million in 2021, compared with \$827 million in 2020 and \$933 million and \$952 million for Dow Inc. and TDCC, respectively, in 2019. Interest expense and amortization of debt discount decreased in 2021 primarily due to lower coupon rates and the redemption of debt. The decrease in 2020 is primarily due to TDCC's redemption of long-term debt in 2019 and debt issuances at lower coupon rates in 2020. See Liquidity and Capital Resources in Management's Discussion and Analysis of Financial Condition and Results of Operations and Note 15 to the Consolidated Financial Statements for additional information related to debt financing activity. In addition, TDCC had interest expense related to an intercompany loan with Dow Inc. in 2019.

Provision for Income Taxes on Continuing Operations

The Company's effective tax rate fluctuates based on, among other factors, where income is earned, the level of income relative to tax attributes and the level of equity earnings, since most earnings from the Company's equity method investments are taxed at the joint venture level. The underlying factors affecting the Company's overall tax rate are summarized in Note 8 to the Consolidated Financial Statements.

The CARES Act was enacted on March 27, 2020 in the United States. There were no significant impacts to the Company's provision for income taxes on continuing operations in 2021 or 2020 as a result of the CARES Act legislation.

The provision for income taxes on continuing operations was \$1,740 million in 2021, compared with \$777 million in 2020 and \$470 million in 2019. The provision for income taxes in 2021 increased primarily due to an increase in pretax income and the recognition of uncertain tax positions in multiple jurisdictions. These factors resulted in an effective tax rate of 21.4 percent for Dow Inc. in 2021.

The tax rate for 2020 was unfavorably impacted by valuation allowances of \$260 million related to foreign tax credits and other attributes that are more likely than not to remain unutilized prior to their expiration. The tax rate for 2020 was favorably impacted by a capital loss resulting from the divestiture of the Santa Vitoria manufacturing facility. This resulted in an effective tax rate of 37.5 percent for Dow Inc. in 2020.

The tax rate for 2019 was unfavorably impacted by non-deductible goodwill and investment impairments, geographic mix of earnings and reduced equity earnings. These factors resulted in a negative effective tax rate of 37.7 percent for Dow Inc. in 2019.

In the fourth quarter of 2019, the Company recorded the impacts of tax law changes enacted in Switzerland. As a result, deferred tax assets increased by \$92 million.

Income from Discontinued Operations, Net of Tax

Income from discontinued operations, net of tax was \$445 million in 2019, related to the distribution of AgCo and SpecCo to DowDuPont as a result of the separation. See Note 3 to the Consolidated Financial Statements for additional information.

Net Income Attributable to Noncontrolling Interests

Net income attributable to noncontrolling interests was \$94 million in 2021, \$69 million in 2020 and \$87 million in 2019. Net income attributable to noncontrolling interests from discontinued operations of \$13 million in 2019 related to the distribution of AgCo and SpecCo to DowDuPont as a result of the separation are included in the amounts above. See Notes 19 and 24 to the Consolidated Financial Statements for additional information.

Net Income (Loss) Available for the Common Stockholder(s)

Dow Inc.

Net income available for Dow Inc. common stockholders was \$6,311 million in 2021, compared with \$1,225 million in 2020 and a net loss of \$1,359 million in 2019. Earnings per share of Dow Inc. was \$8.38 per share in 2021, compared with \$1.64 per share in 2020 and a loss of \$1.84 per share in 2019. See Note 9 to the Consolidated Financial Statements for details on Dow Inc.'s earnings per share calculations.

TDCC

Net income available for TDCC common stockholder was \$6,274 million in 2021, compared with \$1,235 million in 2020 and a net loss of \$1,237 million in 2019. Following the separation from DowDuPont, TDCC's common shares are owned solely by Dow Inc.

SEGMENT RESULTS

The Company conducts its worldwide operations through six global businesses which are organized into the following operating segments: Packaging & Specialty Plastics, Industrial Intermediates & Infrastructure and Performance Materials & Coatings. Corporate contains the reconciliation between the totals for the operating segments and the Company's totals. The Company did not aggregate any operating segments when determining its reportable segments. The Company reports geographic information for the following regions: U.S. & Canada, Asia Pacific, Latin America and EMEA. The Company transfers ethylene to its downstream derivative businesses at market prices. The Company also allocated costs previously assigned to AgCo and SpecCo ("stranded costs") to the operating segments.

The Company's measure of profit/loss for segment reporting purposes is Operating EBIT (for the years ended December 31, 2021 and 2020) and pro forma Operating EBIT (for the year ended December 31, 2019) as this is the manner in which the Company's chief operating decision maker ("CODM") assesses performance and allocates resources. The Company defines Operating EBIT as earnings (i.e., "Income (loss) from continuing operations before income taxes") before interest, excluding the impact of significant items. The Company defines pro forma Operating EBIT as earnings (i.e., "Income (loss) from continuing operations before income taxes") before interest, plus pro forma adjustments, excluding the impact of significant items. Operating EBIT by segment and pro forma Operating EBIT by segment include all operating items relating to the businesses; items that principally apply to Dow as a whole are assigned to Corporate. The Company also presents pro forma net sales for the year ended December 31, 2019, as it is included in management's measure of segment performance and is regularly reviewed by the CODM. Pro forma net sales includes the impact of various manufacturing, supply and service related agreements entered into with DuPont and Corteva in connection with the separation which provide for different pricing than the historical intercompany and intracompany pricing practices of TDCC and Historical DuPont. See Note 26 to the Consolidated Financial Statements for reconciliations of these measures and a summary of the pro forma adjustments impacting segment measures, which are consistent with the pro forma adjustments included in the Current Report on Form 8-K filed on June 3, 2019, with the SEC.

PACKAGING & SPECIALTY PLASTICS

The Packaging & Specialty Plastics operating segment consists of two highly integrated global businesses: Hydrocarbons & Energy and Packaging and Specialty Plastics. The segment employs the industry's broadest polyolefin product portfolio, supported by the Company's proprietary catalyst and manufacturing process technologies. These differentiators, plus collaboration at the customer's design table, enable the segment to deliver more reliable, durable, higher-performing solutions designed for recyclability and enhanced plastics circularity and sustainability. The segment serves customers, brand owners and ultimately consumers in key markets including food and specialty packaging; industrial and consumer packaging; health and hygiene; caps, closures and pipe applications; consumer durables; mobility and transportation; and infrastructure. Ethylene is transferred to downstream derivative businesses at market-based prices, which are generally equivalent to prevailing market prices for large volume purchases. This segment also includes the results of The Kuwait Styrene Company K.S.C.C. and The SCG-Dow Group, as well as a portion of the results of EQUATE Petrochemical Company K.S.C.C.

("EQUATE"), The Kuwait Olefins Company K.S.C.C. ("TKOC"), Map Ta Phut Olefins Company Limited ("Map Ta Phut") and Sadara, all joint ventures of the Company.

The Company is responsible for marketing a majority of Sadara products outside of the Middle East zone through the Company's established sales channels. As part of this arrangement, the Company purchases and sells Sadara products for a marketing fee. In March 2021, Dow and the Saudi Arabian Oil Company agreed to transition the marketing rights and responsibilities for Sadara's finished products to levels more consistent with each partner's equity ownership. This transition began in July 2021 and is being implemented over the next five years.

Packaging & Specialty Plastics	2021	2020	2019
In millions			
Net sales	\$ 28,128	\$ 18,301	\$ 20,245
Pro forma net sales			\$ 20,245
Operating EBIT	\$ 6,638	\$ 2,325	
Pro forma Operating EBIT			\$ 2,904
Equity earnings	\$ 490	\$ 173	\$ 162

Packaging & Specialty Plastics	2021	2020	2019
Percentage change from prior year			
<i>Change in Net Sales from Prior Period due to:</i>			
Local price & product mix	50 %	(11)%	(12)%
Currency	2	—	(1)
Volume	2	1	(3)
Total	54 %	(10)%	(16)%
<i>Change in Pro Forma Net Sales from Prior Period due to:</i>			
Local price & product mix			(12)%
Currency			(1)
Volume			(3)
Total			(16)%

2021 Versus 2020

Packaging & Specialty Plastics net sales were \$28,128 million in 2021, up 54 percent from net sales of \$18,301 million in 2020, with local price up 50 percent, volume up 2 percent and a favorable currency impact of 2 percent, primarily in EMEAI. Local price increased in both businesses and across all geographic regions, driven by tight supply and demand dynamics. Local price increased in Hydrocarbons & Energy as prices for co-products are generally correlated to Brent crude oil prices, which, on average, increased 64 percent compared with 2020. Local price increased in Packaging and Specialty Plastics driven by favorable supply and demand dynamics in polyethylene, notably in industrial and consumer packaging and flexible food and beverage packaging applications. Volume increased in Hydrocarbons & Energy, primarily in the U.S. & Canada and EMEAI, more than offsetting decreased volume in Asia Pacific. Volume decreased in Packaging and Specialty Plastics, primarily in Asia Pacific and Latin America as supply constraints continue to lower exports, more than offsetting an increase in the U.S. & Canada.

Operating EBIT was \$6,638 million in 2021, up \$4,313 million from Operating EBIT of \$2,325 million in 2020. Operating EBIT increased primarily due to integrated margin expansion and increased equity earnings at Sadara and the Thai and Kuwait joint ventures.

2020 Versus 2019

Packaging & Specialty Plastics net sales were \$18,301 million in 2020, down 10 percent from net sales and pro forma net sales of \$20,245 million in 2019, with local price down 11 percent and volume up 1 percent. Net sales declined in the first half of the year, reflecting the impact of the COVID-19 pandemic, while strong supply and demand dynamics took hold in the second half of the year. Local price decreased in both businesses and across all geographic regions, driven by reduced polyethylene prices and lower global energy prices. Local price declined in Hydrocarbons & Energy as prices for co-products are generally correlated to Brent crude oil prices, which declined 33 percent compared with 2019. Volume increased in Hydrocarbons & Energy as increases in EMEA were partially offset by declines in the U.S. & Canada, Asia Pacific and Latin America. Packaging and Specialty Plastics volume was flat as increases in flexible food and specialty packaging, industrial and consumer packaging and health and hygiene applications in Asia Pacific, Latin America and EMEA were offset by reduced demand for functional polymers, primarily due to the COVID-19 pandemic, and lower catalyst licensing activity in the U.S. & Canada.

Operating EBIT was \$2,325 million in 2020, down 20 percent from pro forma Operating EBIT of \$2,904 million in 2019. Operating EBIT decreased primarily due to integrated margin compression in both businesses. These declines more than offset cost reductions, decreased planned maintenance turnaround costs and increased equity earnings.

INDUSTRIAL INTERMEDIATES & INFRASTRUCTURE

The Industrial Intermediates & Infrastructure operating segment consists of two customer-centric global businesses - Industrial Solutions and Polyurethanes & Construction Chemicals - that develop important intermediate chemicals that are essential to manufacturing processes, as well as downstream, customized materials and formulations that use advanced development technologies. These businesses primarily produce and market ethylene oxide and propylene oxide derivatives that are aligned to market segments as diverse as appliances, coatings, electronics, surfactants for cleaning and sanitization, infrastructure and oil and gas. The businesses' global scale and reach, world-class technology, R&D capabilities and materials science expertise enable the Company to be a premier solutions provider offering customers value-add sustainable solutions to enhance comfort, energy efficiency, product effectiveness and durability across a wide range of home comfort and appliance, building and construction, mobility and transportation, adhesive and lubricant applications, among others. This segment also includes a portion of the results of EQUATE, TKOC, Map Ta Phut and Sadara, all joint ventures of the Company.

The Company is responsible for marketing a majority of Sadara products outside of the Middle East zone through the Company's established sales channels. As part of this arrangement, the Company purchases and sells Sadara products for a marketing fee. In March 2021, Dow and the Saudi Arabian Oil Company agreed to transition the marketing rights and responsibilities for Sadara's finished products to levels more consistent with each partner's equity ownership. This transition began in July 2021 and is being implemented over the next five years.

Industrial Intermediates & Infrastructure			
In millions	2021	2020	2019
Net sales	\$ 16,851	\$ 12,021	\$ 13,440
Pro forma net sales			\$ 13,449
Operating EBIT	\$ 2,282	\$ 355	
Pro forma Operating EBIT			\$ 845
Equity earnings (losses)	\$ 471	\$ (166)	\$ (241)

Industrial Intermediates & Infrastructure			
Percentage change from prior year	2021	2020	2019
<i>Change in Net Sales from Prior Period due to:</i>			
Local price & product mix	40 %	(5)%	(12)%
Currency	2	—	(1)
Volume	(2)	(6)	—
Total	40 %	(11)%	(13)%
<i>Change in Pro Forma Net Sales from Prior Period due to:</i>			
Local price & product mix			(12)%
Currency			(2)
Volume			1
Total			(13)%

2021 Versus 2020

Industrial Intermediates & Infrastructure net sales were \$16,851 million in 2021, up 40 percent from \$12,021 million in 2020, with local price up 40 percent, a favorable currency impact of 2 percent and volume down 2 percent. Local price increased in both businesses and across all geographic regions, primarily driven by strong supply and demand dynamics and rising energy prices. Currency favorably impacted sales in both businesses. Volume in Polyurethanes & Construction Chemicals decreased in the U.S. & Canada and Asia Pacific, partially offset by increased volume in EMEAI and Latin America. The volume decrease in Polyurethanes & Construction Chemicals was due to a decrease in vinyl chloride monomers mainly related to a planned transition of a low-margin co-producer contract as well as a decrease in isocyanates, which were partially offset by robust consumer demand in polyurethane systems. Despite strong consumer demand, volume in Industrial Solutions decreased in all geographic regions, except Latin America and was largely driven by weather-related supply constraints.

Operating EBIT was \$2,282 million in 2021, up \$1,927 million from Operating EBIT of \$355 million in 2020. Operating EBIT increased primarily due to margin expansion from strong supply and demand dynamics in Polyurethanes & Construction Chemicals and higher equity earnings at Sadara and the Kuwait joint ventures.

2020 Versus 2019

Industrial Intermediates & Infrastructure net sales were \$12,021 million in 2020, down 11 percent from \$13,440 million in 2019. Net sales decreased 11 percent from pro forma net sales of \$13,449 million in 2019, with volume down 6 percent and local price down 5 percent. Weak demand for products used in consumer durable good end-markets, including construction, furniture and bedding, appliances and automotive, drove volume declines in Polyurethanes & Construction Chemicals in all geographic regions, reflecting the impact of the COVID-19 pandemic on consumer activities and buying patterns, most notably in the first half of the year. Volume in Industrial Solutions was also impacted by the COVID-19 pandemic, with decreases in the U.S. & Canada and Latin America which were partially offset by increases in Asia Pacific and EMEAI. The volume decline in Industrial Solutions was due to weakened demand in industrial, energy and automotive end-markets partially offset by stronger demand for products used in electronics, agriculture and pharma applications. Local price decreased in both businesses and in all geographic regions, primarily due to lower global energy prices and raw material costs.

Operating EBIT was \$355 million in 2020, down 58 percent from pro forma Operating EBIT of \$845 million in 2019. Operating EBIT decreased due to lower demand and margin compression, which were partially offset by cost reductions, decreased equity losses and lower planned maintenance turnaround costs. The overall decrease in equity losses was driven by lower equity losses from Sadara partially offset by decreased equity earnings from EQUATE.

PERFORMANCE MATERIALS & COATINGS

The Performance Materials & Coatings operating segment includes industry-leading franchises that deliver a wide array of solutions into consumer, infrastructure and mobility end-markets. The segment consists of two global businesses: Coatings & Performance Monomers and Consumer Solutions. These businesses primarily utilize the Company's acrylics-, cellulose- and silicone-based technology platforms to serve the needs of the architectural and industrial coatings; home care and personal care; consumer and electronics; mobility and transportation; industrial and chemical processing; and building and infrastructure end-markets. Both businesses employ materials science capabilities, global reach and unique products and technology to combine chemistry platforms to deliver differentiated, market-driven and sustainable innovations to customers.

Performance Materials & Coatings			
In millions	2021	2020	2019
Net sales	\$ 9,672	\$ 7,951	\$ 8,923
Pro forma net sales			\$ 8,961
Operating EBIT	\$ 866	\$ 314	
Pro forma Operating EBIT			\$ 918
Equity earnings	\$ 7	\$ 6	\$ 5

Performance Materials & Coatings			
Percentage change from prior year	2021	2020	2019
<i>Change in Net Sales from Prior Period due to:</i>			
Local price & product mix	19 %	(6)%	(6)%
Currency	2	—	(2)
Volume	1	(6)	(3)
Portfolio & other	—	1	3
Total	22 %	(11)%	(8)%
<i>Change in Pro Forma Net Sales from Prior Period due to: ¹</i>			
Local price & product mix		(6)%	(6)%
Currency		—	(2)
Volume		(5)	(1)
Portfolio & other		—	—
Total		(11)%	(9)%

1. As reported net sales for the year ended December 31, 2020 compared with pro forma net sales for the year ended December 31, 2019.

2021 Versus 2020

Performance Materials & Coatings net sales were \$9,672 million in 2021, up 22 percent from net sales of \$7,951 million in 2020, with local price up 19 percent, volume up 1 percent, and a favorable currency impact of 2 percent. Local price increased in both businesses and across all geographic regions. Consumer Solutions local price increased in both upstream siloxanes and downstream silicones due to favorable supply and demand dynamics and higher raw material costs. Local price increased in Coatings & Performance Monomers primarily due to improved supply and demand dynamics and higher raw material costs in acrylic monomers and architectural coatings. Volume increased in the U.S. & Canada, Asia Pacific and Latin America, which was partially offset by a decrease in EMEA. Consumer Solutions volume increased due to higher demand in all geographic regions partially offset by planned maintenance turnaround activity. Volume decreased in Coatings & Performance Monomers in all geographic regions primarily due to supply availability challenges caused by weather-related outages and third-party supply and logistics constraints. The favorable currency impact was driven by Asia Pacific and EMEA.

Operating EBIT was \$866 million in 2021, up \$552 million from Operating EBIT of \$314 million in 2020. Operating EBIT increased primarily due to margin expansion and higher volume in Consumer Solutions.

2020 Versus 2019

Performance Materials & Coatings net sales were \$7,951 million in 2020, down 11 percent from net sales of \$8,923 million in 2019. Net sales decreased 11 percent from pro forma net sales of \$8,961 million in 2019, with local price down 6 percent and volume down 5 percent. Local price decreased in both businesses and across all geographic regions. Consumer Solutions local price declined in all regions, primarily in upstream siloxanes due to weak supply and demand dynamics. Local price decreased in Coatings & Performance Monomers in response to lower feedstock and other raw material costs. Volume declined in all geographic regions except Latin America, reflecting the impact from the COVID-19 pandemic. Consumer Solutions volume decreased as growth in home care applications was more than offset by lower demand for products used in automotive, industrial, construction and personal care end-markets as consumer activities and buying patterns were limited by the COVID-19 pandemic. Coatings & Performance Monomers volume increased in all geographic regions, except EMEA. Volume gains were driven by higher demand for methacrylates used in protective applications, for architectural coatings as consumers continued do-it-yourself projects at home, and higher demand for vinyl acetate monomers.

Operating EBIT was \$314 million in 2020, down 66 percent from pro forma Operating EBIT of \$918 million in 2019. Operating EBIT decreased primarily due to margin compression, lower demand in siloxanes as a result of the COVID-19 pandemic and higher manufacturing and planned maintenance turnaround costs that more than offset volume gains in Coatings & Performance Monomers and lower SG&A costs.

CORPORATE

Corporate includes certain enterprise and governance activities (including insurance operations, environmental operations, etc.); non-business aligned joint ventures; non-business aligned litigation expenses; and discontinued or non-aligned businesses.

Corporate			
In millions		2021	2020
Net sales		\$ 317	\$ 269
Pro forma net sales			\$ 343
Operating EBIT		\$ (253)	\$ (279)
Pro forma Operating EBIT			\$ (315)
Equity earnings (losses)		\$ 7	\$ (31)

2021 Versus 2020

Net sales for Corporate, which primarily relate to the Company's insurance operations, were \$317 million in 2021, up from net sales of \$269 million in 2020.

Operating EBIT was a loss of \$253 million in 2021, compared with Operating EBIT loss of \$279 million in 2020. Operating EBIT improved primarily due to improved equity earnings.

2020 Versus 2019

Net sales for Corporate, which primarily relate to the Company's insurance operations, were \$269 million in 2020, down from net sales and pro forma net sales of \$343 million in 2019.

Operating EBIT was a loss of \$279 million in 2020, compared with a pro forma Operating EBIT loss of \$315 million in 2019. Compared with 2019, Operating EBIT improved primarily due to cost reductions and stranded cost removal throughout 2019.

OUTLOOK

Operating Segments & End-Market Expectations

In 2022, economic forecasts are projecting above average global gross domestic product ("GDP") growth rates due to strong industrial and consumer demand trends which have the potential to positively impact sales volume. Inflationary impacts on natural gas and feedstocks, driven by external macroeconomic and geopolitical factors, remain a potential risk in the near-term, but are expected to be moderate as warmer weather lowers demand for heating supply. The Company anticipates constructive global demand for crude oil compared with 2021 due to ongoing recovery in travel and mobility. Crude oil fundamentals suggest global supply will lag the growing demand that provides support to oil prices and oil-to-gas spreads.

In Packaging & Specialty Plastics, supply improvements following significant weather-related disruptions in 2021 are expected to drive sales volume on continued underlying demand strength, notably in flexible food and specialty packaging, industrial and consumer packaging and functional polymers. Integrated margins are expected to stabilize with recent industry supply additions. The Company's regional feedstock cost advantages will help offset elevated raw material and energy costs. Other important factors that will impact performance are raw material and logistics challenges; industry operating rates; and timing of additional industry capacity startups.

In Industrial Intermediates & Infrastructure, volume growth is expected across the portfolio, driven by continued underlying demand strength for products used in furniture and bedding, appliances, automotive, construction, electronics and pharma applications. The methylene diphenyl diisocyanate value chain is expected to remain tight with industry capacity additions trailing demand growth. Propylene oxide is expected to be impacted by new capacity entering the market, particularly in Asia Pacific. Ethylene oxide supply is expected to remain tight, with limited industry capacity additions in the near-term and continued demand strength. Margins for the segment are expected to benefit from high-value specialties aligned to strategic incremental growth capacity additions.

In Performance Materials & Coatings, sales growth is expected in downstream silicones, particularly for products used in mobility and transportation, high performance building and construction, industrial, consumer, and electronics applications. The Company continues to pursue incremental downstream silicones capacity debottlenecking and growth projects to meet demand growth in consumer-driven end-markets. Within siloxanes, increased supply availability is expected to drive sales volume. Global demand strength in architectural and industrial coatings is expected to drive sales volume. The Company remains well-positioned to benefit from its customers' shift to sustainable chemistries where Dow has unique technologies and solutions to offer in both business units.

Other factors impacting operating segment profitability include:

- Planned maintenance turnaround spending is expected to increase approximately \$100 million compared with 2021 due to inflationary pressures on materials and labor.
- Equity in earnings of nonconsolidated affiliates is expected to decrease compared with 2021 as margins compress on industry supply additions, lower Asian olefins and mono ethylene glycol prices, and increasing raw material costs.

Projected Uses of Cash

Items that may impact the consolidated statements of cash flows in 2022 include:

- Cash contributions to pension plans are expected to be approximately \$250 million.
- Capital expenditures are expected to be approximately \$2.2 billion.
- Cash expenditures related to the Digital Acceleration program are expected to be \$250 million in 2022.
- Cash outflows related to the Company's 2020 Restructuring Program, including restructuring implementation costs, are expected to be approximately \$175 million.
- Cash dividends from equity companies are expected to increase following increased equity earnings in 2021.

LIQUIDITY AND CAPITAL RESOURCES

The Company had cash and cash equivalents of \$2,988 million at December 31, 2021 and \$5,104 million at December 31, 2020, of which \$1,745 million at December 31, 2021 and \$862 million at December 31, 2020, was held by subsidiaries in foreign countries, including United States territories. For each of its foreign subsidiaries, the Company makes an assertion regarding the amount of earnings intended for permanent reinvestment, with the balance available to be repatriated to the United States.

The cash held by foreign subsidiaries for permanent reinvestment is generally used to finance the subsidiaries' operational activities and future foreign investments. Dow has the ability to repatriate additional funds to the U.S., which could result in an adjustment to the tax liability for foreign withholding taxes, foreign and/or U.S. state income taxes and the impact of foreign currency movements. At December 31, 2021, management believed that sufficient liquidity was available in the United States. The Company has and expects to continue repatriating certain funds from its non-U.S. subsidiaries that are not needed to finance local operations; however, these particular repatriation activities have not and are not expected to result in a significant incremental tax liability to the Company.

The Company's cash flows from operating, investing and financing activities, as reflected in the consolidated statements of cash flows, are summarized in the following table:

Cash Flow Summary In millions	Dow Inc.			TDCC		
	2021	2020	2019	2021	2020	2019
Cash provided by (used for):						
Operating activities - continuing operations	\$ 7,069	\$ 6,252	\$ 5,713	\$ 7,200	\$ 6,263	\$ 5,706
Operating activities - discontinued operations	(60)	(26)	217	—	—	371
Operating activities	7,009	6,226	5,930	7,200	6,263	6,077
Investing activities - continuing operations	(2,914)	(841)	(2,158)	(2,914)	(841)	(2,158)
Investing activities - discontinued operations	—	—	(34)	—	—	(34)
Investing activities	(2,914)	(841)	(2,192)	(2,914)	(841)	(2,192)
Financing activities - continuing operations	(6,071)	(2,764)	(4,077)	(6,262)	(2,801)	(4,224)
Financing activities - discontinued operations	—	—	(18)	—	—	(18)
Financing activities	(6,071)	(2,764)	(4,095)	(6,262)	(2,801)	(4,242)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(99)	107	(27)	(99)	107	(27)
Summary						
Increase (decrease) in cash, cash equivalents and restricted cash	(2,075)	2,728	(384)	(2,075)	2,728	(384)
Cash, cash equivalents and restricted cash at beginning of year	5,108	2,380	2,764	5,108	2,380	2,764
Cash, cash equivalents and restricted cash at end of year	\$ 3,033	\$ 5,108	\$ 2,380	\$ 3,033	\$ 5,108	\$ 2,380
Less: Restricted cash and cash equivalents, included in "Other current assets"	45	4	13	45	4	13
Cash and cash equivalents at end of year	\$ 2,988	\$ 5,104	\$ 2,367	\$ 2,988	\$ 5,104	\$ 2,367

Cash Flows from Operating Activities

Cash provided by operating activities from continuing operations in 2021 was primarily driven by the Company's cash earnings and dividends from equity method investments, which were partially offset by cash used for working capital requirements, pension contributions and performance-based compensation payments. Cash provided by operating activities from continuing operations in 2020 was primarily driven by the Company's cash earnings, cash receipts related to an advance payment from a customer and the Nova ethylene asset matter, dividends from equity method investments and working capital improvements, which were partially offset by pension contributions. Cash provided by operating activities from continuing operations in 2019 was primarily driven by the Company's cash earnings, dividends from equity method investments, working capital improvements, cash receipts related to an advance payment from a customer and the Nova ethylene asset matter, which were partially offset by performance-based compensation payments and pension contributions.

Net Working Capital and Current Ratio at Dec 31 In millions	Dow Inc.		TDCC	
	2021	2020	2021	2020
Current assets	\$ 20,848	\$ 19,084	\$ 20,837	\$ 18,998
Current liabilities	13,226	11,108	13,046	10,574
Net working capital	\$ 7,622	\$ 7,976	\$ 7,791	\$ 8,424
Current ratio	1.58:1	1.72:1	1.60:1	1.80:1

Working Capital Metrics	Twelve Months Ended	
	Dec 31, 2021	Dec 31, 2020
Days sales outstanding in trade receivables	40	48
Days sales in inventory	54	65
Days payables outstanding	57	66

Cash provided by (used for) operating activities from discontinued operations primarily related to cash payments and receipts the Company had with DuPont and Corteva that related to certain agreements and matters related to the separation from DowDuPont. See Note 3 to the Consolidated Financial Statements for additional information.

Cash Flows from Investing Activities

Cash used for investing activities from continuing operations in 2021 was primarily for capital expenditures and purchases of investments and previously leased assets, which were partially offset by proceeds from sales and maturities of investments. Cash used for investing activities from continuing operations in 2020 was primarily for capital expenditures, purchases of investments, investments in and loans to nonconsolidated affiliates (related to Sadara) and acquisitions of property and businesses, which were partially offset by proceeds from sales and maturities of investments and proceeds from sales of property and businesses. Cash used for investing activities from continuing operations in 2019 was primarily for capital expenditures, purchases of investments and investments in and loans to nonconsolidated affiliates, which were partially offset by proceeds from sales and maturities of investments.

The Company loaned Sadara \$333 million in 2020 and \$473 million in 2019. As a result of Sadara's debt re-profiling completed in the first quarter of 2021, the Company did not provide any shareholder loans or equity contributions to Sadara in 2021. See Notes 12 and 16 to the Consolidated Financial Statements for additional information.

The Company's capital expenditures related to continuing operations were \$1,501 million in 2021, \$1,252 million in 2020 and \$1,961 million in 2019. Capital spending was higher in 2021 as the Company ramped up its growth projects and investments to keep pace with demand recovery. The Company expects capital spending in 2022 to be approximately \$2.2 billion.

Capital spending in recent years has included an expansion of the Company's new ethylene production facility in Freeport, Texas, which commenced operations in 2020, bringing the facility's total ethylene capacity to 2,000 kilotonnes per annum and making it the largest ethylene cracker in the world; the addition of a furnace to the Company's ethylene production facility in Alberta, Canada, which commenced operations in 2021; the retrofit of one of the Company's Louisiana steam crackers with Dow's proprietary fluidized catalytic dehydrogenation ("FCDh") technology to produce on-purpose propylene and the addition of a new specialty alkoxylation reactor in Plaquemine, Louisiana, which are both expected to be completed in the second half of 2022; and the addition of an integrated MDI distillation and prepolymers facility at its site in Freeport, Texas, which is expected to be completed in 2023.

Cash used for investing activities from discontinued operations in 2019 was primarily for capital expenditures, partially offset by proceeds from the sales of property, businesses and ownership interests in nonconsolidated affiliates.

Cash Flows from Financing Activities

Cash used for financing activities from continuing operations in 2021 included payments on long-term debt and transaction financing, debt issuance and other costs, which were partially offset by proceeds from issuance of common stock. In addition, Dow Inc. included cash outflows for dividends paid to stockholders and purchases of treasury stock and TDCC included cash outflows for dividends paid to Dow Inc. Cash used for financing activities from continuing operations in 2020 included payments on long-term debt, changes in short-term notes payable and transaction financing, debt issuance and other costs, which were partially offset by proceeds from issuance of long-term debt. In addition, Dow Inc. included cash outflows for dividends paid to stockholders and purchases of treasury stock and TDCC included cash outflows for dividends paid to Dow Inc. Cash used for financing activities from continuing operations in 2019 included payments on long-term debt and dividends paid to DowDuPont, which were partially offset by proceeds from issuance of long-term debt. In addition, Dow Inc. received cash as part of the separation from DowDuPont, which was more than offset by dividends paid to stockholders and purchases of treasury stock. See Notes 15 and 18 to the Consolidated Financial Statements for additional information related to the issuance and retirement of debt and the Company's share repurchases and dividends.

Cash used for financing activities from discontinued operations in 2019 primarily related to distributions to noncontrolling interests and employee taxes paid for share-based payment arrangements.

Non-GAAP Cash Flow Measures

Free Cash Flow

Dow defines free cash flow as "Cash provided by operating activities - continuing operations," less capital expenditures. Under this definition, free cash flow represents the cash generated by Dow from operations after investing in its asset base. Free cash flow, combined with cash balances and other sources of liquidity, represents the cash available to fund obligations and provide returns to shareholders. Free cash flow is an integral financial measure used in the Company's financial planning process.

Operating EBITDA and Pro Forma Operating EBITDA

Dow defines Operating EBITDA (for the years ended December 31, 2021 and 2020) as earnings (i.e., "Income from continuing operations before income taxes") before interest, depreciation and amortization, excluding the impact of significant items. Pro forma Operating EBITDA (for the year ended December 31, 2019) is defined as earnings (i.e. "Income (loss) from continuing operations before income taxes") before interest, depreciation and amortization, plus pro forma adjustments, excluding the impact of significant items.

Cash Flow Conversion (Operating EBITDA or Pro Forma Operating EBITDA to Cash Flow From Operations)

Dow defines cash flow conversion (Operating EBITDA or pro forma Operating EBITDA to cash flow from operations) as "Cash provided by operating activities - continuing operations," divided by Operating EBITDA or pro forma Operating EBITDA. Management believes cash flow conversion is an important financial metric as it helps the Company determine how efficiently it is converting its earnings into cash flow.

These financial measures are not recognized in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP") and should not be viewed as alternatives to U.S. GAAP financial measures of performance. All companies do not calculate non-GAAP financial measures in the same manner and, accordingly, Dow's definitions may not be consistent with the methodologies used by other companies.

Reconciliation of Non-GAAP Cash Flow Measures	Dow Inc.		
	2021	2020	2019
In millions			
Cash provided by operating activities - continuing operations (GAAP)	\$ 7,069	\$ 6,252	\$ 5,713
Capital expenditures	(1,501)	(1,252)	(1,961)
Free cash flow (non-GAAP) ¹	\$ 5,568	\$ 5,000	\$ 3,752

1. Free cash flow for the year ended December 31, 2021 reflects a \$1 billion elective pension contribution.

Reconciliation of Cash Flow Conversion (Operating EBITDA or Pro Forma Operating EBITDA to Cash Flow From Operations)	Dow Inc.		
	2021	2020	2019 ¹
In millions			
Income (loss) from continuing operations, net of tax (GAAP)	\$ 6,405	\$ 1,294	\$ (1,717)
+ Provision for income taxes on continuing operations	1,740	777	470
Income (loss) from continuing operations before income taxes	\$ 8,145	\$ 2,071	\$ (1,247)
- Interest income	55	38	81
+ Interest expense and amortization of debt discount	731	827	933
+ Pro forma adjustments ²	—	—	65
- Significant items ³	(712)	145	(4,682)
Operating EBIT (non-GAAP)	\$ 9,533	\$ 2,715	\$ 4,352
+ Depreciation and amortization	2,842	2,874	2,938
Operating EBITDA (non-GAAP)	\$ 12,375	\$ 5,589	\$ 7,290
Cash provided by operating activities - continuing operations (GAAP)	\$ 7,069	\$ 6,252	\$ 5,713
Cash flow conversion (Operating EBITDA or pro forma Operating EBITDA to cash flow from operations) (non-GAAP) ⁴	57.1 %	111.9 %	78.4 %

1. Operating EBIT, depreciation and amortization and Operating EBITDA for the year ended December 31, 2019 is presented on a pro forma basis.

2. Pro forma adjustments for the year ended December 31, 2019 include: (1) the margin impact of various manufacturing, supply and service related agreements entered into with DuPont and Corteva in connection with the separation which provide for different pricing than the historical intercompany and intracompany pricing practices of TDCC and Historical DuPont and (2) the elimination of the impact of events directly attributable to the Merger, internal reorganization and business realignment, separation, distribution and other related transactions (e.g., one-time transaction costs).

3. The year ended December 31, 2021 includes costs associated with the Company's digital acceleration program; restructuring, implementation costs and asset related charges - net; a loss on early extinguishment of debt; a gain on a previous divestiture, litigation related charges, awards and adjustments; and indemnification and other transaction related costs. The year ended December 31, 2020 includes integration and separation costs, restructuring, implementation costs and asset related charges - net, a gain on a warranty accrual adjustment of an exited business, a net gain on divestitures and asset sale, a gain related to a legal matter with Nova, a loss on early extinguishment of debt and a loss associated with agreements entered into with DuPont and Corteva as part of the separation and distribution. The year ended December 31, 2019 includes integration and separation costs, restructuring, goodwill impairment and asset related charges - net, a gain on a warranty accrual adjustment of an exited business, environmental charges, a loss related to previous divestitures, a loss on early extinguishment of debt, a net gain related to litigation matters and a loss associated with agreements entered into with DuPont and Corteva as part of the separation and distribution. See Note 26 to the Consolidated Financial Statements for additional information.

4. Cash flow conversion for the year ended December 31, 2021 reflects a \$1 billion elective pension contribution.

Liquidity & Financial Flexibility

The Company's primary source of incremental liquidity is cash flows from operating activities. The generation of cash from operations and the Company's ability to access capital markets is expected to meet the Company's cash requirements for working capital, capital expenditures, debt maturities, contributions to pension plans, dividend distributions to stockholders, share repurchases and other needs. In addition to cash from operating activities, the Company's current liquidity sources also include TDCC's U.S. and Euromarket commercial paper programs, committed and uncommitted credit facilities, committed accounts receivable facilities, a U.S. retail note program ("InterNotes®") and other debt markets.

The Company continues to maintain a strong financial position with all of its committed credit facilities undrawn and fully available at December 31, 2021. Cash and committed and available forms of liquidity were \$12.6 billion at December 31, 2021. The Company also has no substantive long-term debt maturities due until 2026. Additional details on sources of liquidity are as follows:

Commercial Paper

TDCC issues promissory notes under its U.S. and Euromarket commercial paper programs. TDCC had no commercial paper outstanding at December 31, 2021 and 2020. TDCC maintains access to the commercial paper market at competitive rates. Amounts outstanding under TDCC's commercial paper programs during the period may be greater or less than the amount reported at the end of the period. Subsequent to December 31, 2021, TDCC issued approximately \$1.3 billion of commercial paper.

Committed Credit Facilities

The Company also has the ability to access liquidity through TDCC's committed and available credit facilities. At December 31, 2021, TDCC had total committed and available credit facilities of \$8.1 billion. See Note 15 to the Consolidated Financial Statements for additional information on committed and available credit facilities.

Committed Accounts Receivable Facilities

In addition to the above committed credit facilities, the Company maintains a committed accounts receivable facility in the U.S. where eligible trade accounts receivable, up to \$900 million, may be sold at any point in time. The Company also maintains a committed accounts receivable facility in Europe where eligible trade accounts receivable, up to €500 million, may be sold at any point in time. At December 31, 2021, there were no receivables sold under the U.S. and Europe committed accounts receivable facilities. See Note 14 to the Consolidated Financial Statements for additional information.

Company-Owned Life Insurance

The Company has investments in company-owned life insurance ("COLI") policies, which are recorded at their cash surrender value as of each balance sheet date. The Company has the ability to monetize its investment in its COLI policies as an additional source of liquidity. In the first quarter of 2021, the Company monetized \$200 million of its existing COLI policies' surrender value. In the second quarter of 2021, the Company repaid the drawdown against the cash surrender value. The Company had no outstanding monetization of its existing COLI policies' surrender value at December 31, 2021. See Note 7 to the Consolidated Financial Statements for additional information.

Uncommitted Credit Facilities

The Company has entered into various uncommitted bilateral credit arrangements as a potential source of excess liquidity. These lines can be used to support short-term liquidity needs and for general purposes, including letters of credit. The Company had no drawdowns outstanding at December 31, 2021.

Letters of Credit

TDCC utilizes letters of credit to support commitments made in the ordinary course of business. While the terms and amounts of letters of credit change, TDCC generally has approximately \$400 million of outstanding letters of credit at any given time.

Early Settlement of Letters of Credit

The Company utilizes, from time-to-time, letters of credit discounting programs to manage and expedite the settlement of letters of credit in certain regions. These letters of credit are associated with accounts receivable and the Company retains no interest in the transferred letters of credit or receivables once sold.

Shelf Registration - U.S.

On July 26, 2019, Dow Inc. and TDCC filed a shelf registration statement with the SEC. The shelf indicates that Dow Inc. may offer common stock; preferred stock; depositary shares; debt securities; guarantees; warrants to purchase common stock, preferred stock and debt securities; and stock purchase contracts and stock purchase units, with pricing and availability of any such offerings depending on market conditions. The shelf also indicates that TDCC may offer debt securities, guarantees and warrants to purchase debt securities, with pricing and availability of any such offerings depending on market conditions. Also on July 26, 2019, TDCC filed a new prospectus supplement under this shelf registration to register an unlimited amount of securities for issuance under InterNotes®. The shelf registration expires on July 26, 2022. The Company expects to renew the shelf registration.

Debt

As the Company continues to maintain its strong balance sheet and financial flexibility, management is focused on net debt (a non-GAAP financial measure), as the Company believes this is the best representation of its financial leverage at this point in time. As shown in the following table, net debt is equal to total gross debt minus "Cash and cash equivalents" and "Marketable securities." At December 31, 2021, net debt as a percentage of total capitalization for Dow Inc. and TDCC decreased to 37.9 percent and 37.5 percent, respectively, compared with 47.9 percent and 46.8 percent, respectively, at December 31, 2020.

Total Debt at Dec 31 In millions	Dow Inc.		TDCC	
	2021	2020	2021	2020
Notes payable	\$ 161	\$ 156	\$ 161	\$ 156
Long-term debt due within one year	231	460	231	460
Long-term debt	14,280	16,491	14,280	16,491
Gross debt	\$ 14,672	\$ 17,107	\$ 14,672	\$ 17,107
- Cash and cash equivalents	2,988	5,104	2,988	5,104
- Marketable securities ¹	245	45	245	45
Net debt	\$ 11,439	\$ 11,958	\$ 11,439	\$ 11,958
Total equity	\$ 18,739	\$ 13,005	\$ 19,029	\$ 13,569
Gross debt as a percentage of total capitalization	43.9 %	56.8 %	43.5 %	55.8 %
Net debt as a percentage of total capitalization	37.9 %	47.9 %	37.5 %	46.8 %

1. Included in "Other current assets" in the consolidated balance sheets.

In the second quarter of 2021, the Company redeemed \$208 million aggregate principal amount of 3.15 percent notes due May 2024 and \$811 million aggregate principal amount of 3.50 percent notes due October 2024.

In the third quarter of 2021, the Company completed cash tender offers for certain debt securities. In total, \$1,042 million aggregate principal amount was tendered and retired. In addition, the Company voluntarily repaid \$81 million of long-term debt due within one year.

The Company may at any time repurchase certain debt securities in the open market or in privately negotiated transactions subject to: the applicable terms under which any such debt securities were issued, certain internal approvals of the Company, and applicable laws and regulations of the relevant jurisdiction in which any such potential transactions might take place. This in no way obligates the Company to make any such repurchases nor should it be considered an offer to do so.

TDCC's public debt instruments and primary, private credit agreements contain, among other provisions, certain customary restrictive covenant and default provisions. TDCC's most significant debt covenant with regard to its financial position is the obligation to maintain the ratio of its consolidated indebtedness to consolidated capitalization at no greater than 0.70 to 1.00 at any time the aggregate outstanding amount of loans under the Five Year Competitive Advance and Revolving Credit Facility Agreement ("Revolving Credit Agreement") equals or exceeds \$500 million. The ratio of TDCC's consolidated indebtedness as defined in the Revolving Credit Agreement was .40 to 1.00 at December 31, 2021. Management believes TDCC was in compliance with all of its covenants and default provisions at December 31, 2021. The Revolving Credit Agreement was extended in November 2021 to include favorable updates to the terms and conditions and matures in November 2026.

On April 1, 2019, DowDuPont completed the separation of its materials science business and Dow Inc. became the direct parent company of TDCC. In conjunction with the separation, Dow Inc. is obligated, substantially concurrently with the issuance of any guarantee in respect of outstanding or committed indebtedness under the Revolving Credit Agreement, to enter into a supplemental indenture with TDCC and the trustee under TDCC's existing 2008 base indenture governing certain notes issued by TDCC. Under such supplemental indenture, Dow Inc. will guarantee all outstanding debt securities and all amounts due under such existing base indenture and will become subject to certain covenants and events of default under the existing base indenture.

In addition, the Revolving Credit Agreement includes an event of default which would be triggered in the event Dow Inc. incurs or guarantees third party indebtedness for borrowed money in excess of \$250 million or engages in any material activity or directly owns any material assets, in each case, subject to certain conditions and exceptions. Dow Inc. may, at its option, cure the event of default by delivering an unconditional and irrevocable guarantee to the administrative agent within thirty days of the event or events giving rise to such event of default.

No such events have occurred or have been triggered at the time of the filing of this Annual Report on Form 10-K. See Note 15 to the Consolidated Financial Statements for information related to TDCC's notes payable and long-term debt activity and information on TDCC's debt covenants and default provisions.

While taking into consideration the current economic environment, management expects that the Company will continue to have sufficient liquidity and financial flexibility to meet all of its business obligations.

Credit Ratings

TDCC's credit ratings at January 31, 2022 were as follows:

Credit Ratings	<i>Long-Term Rating</i>	<i>Short-Term Rating</i>	<i>Outlook</i>
Fitch Ratings	BBB+	F2	Stable
Moody's Investors Service	Baa2	P-2	Stable
Standard & Poor's	BBB	A-2	Stable

On April 13, 2021, Fitch reaffirmed TDCC's BBB+ and F2 rating, and revised its outlook to stable from negative. The decision was made as part of Fitch's annual review process.

On June 10, 2021, S&P announced a credit rating upgrade for TDCC from BBB- and A-3 to BBB and A-2, maintaining stable outlook. The decision from S&P reflects the expectation for an ongoing macroeconomic recovery, the Company's supportive financial policies and the strengthening of its operating performance in 2021 relative to 2020.

Dividends

Dow Inc.

Dow Inc. has paid dividends on a quarterly basis since the separation from DowDuPont and expects to continue to do so, subject to approval by the Board. The dividends declared by the Board align to the Company's strategy announced in 2018 of returning approximately 45 percent of operating net income¹ to the shareholders through the dividend and total shareholder remuneration of approximately 65 percent, when including share repurchases, over the economic cycle. The following tables provide information on dividends declared and paid to common stockholders:

Dividends Paid for the Years Ended Dec 31	<i>2021</i>	<i>2020</i>	<i>2019¹</i>
In millions, except per share amounts			
Dividends paid, per common share	\$ 2.80	\$ 2.80	\$ 2.10
Dividends paid to common stockholders	\$ 2,073	\$ 2,071	\$ 1,550

1. Reflects Dow Inc. activity subsequent to the separation from DowDuPont.

Dow Inc. Cash Dividends Declared and Paid			
<i>Declaration Date</i>	<i>Record Date</i>	<i>Payment Date</i>	<i>Amount (per share)</i>
February 11, 2021	February 26, 2021	March 12, 2021	\$ 0.70
April 15, 2021	May 28, 2021	June 11, 2021	\$ 0.70
August 12, 2021	August 31, 2021	September 10, 2021	\$ 0.70
October 14, 2021	November 30, 2021	December 10, 2021	\$ 0.70

1. Operating net income is a non-GAAP measure that Dow defines as "Net income (loss) available for Dow Inc. common stockholders," excluding the impact of significant items.

TDCC

Effective with the Merger, TDCC no longer has publicly traded common stock. From the Merger Date through March 31, 2019, TDCC's common shares were owned solely by DowDuPont. Pursuant to the Merger Agreement, TDCC committed to fund a portion of DowDuPont's dividends paid to common stockholders and certain governance expenses. Funding was accomplished through intercompany loans. On a quarterly basis, TDCC's Board reviewed and determined a dividend distribution to DowDuPont to settle the intercompany loans. The dividend distribution considered the level of TDCC's earnings and cash flows and the outstanding intercompany loan balances. TDCC declared and paid dividends to DowDuPont of \$535 million for the year ended December 31, 2019. See Note 25 to the Consolidated Financial Statements for additional information.

Effective with the separation from DowDuPont on April 1, 2019, TDCC became a wholly owned subsidiary of Dow Inc. TDCC has committed to fund Dow Inc.'s dividends paid to common stockholders, share repurchases and certain governance expenses. Funding is accomplished through intercompany loans. TDCC's Board reviews and determines a dividend distribution to Dow Inc. to settle the intercompany loans. For the year ended December 31, 2021, TDCC declared and paid dividends to Dow Inc. of \$3,264 million (\$2,233 million for the year ended December 31, 2020 and \$201 million for the year ended December 31, 2019). At December 31, 2021, TDCC's intercompany loan balance with Dow Inc. was insignificant. See Note 25 to the Consolidated Financial Statements for additional information.

Share Repurchase Program

Dow Inc.

On April 1, 2019, Dow Inc.'s Board ratified the share repurchase program originally approved on March 15, 2019, authorizing up to \$3.0 billion to be spent on the repurchase of the Company's common stock, with no expiration date. In 2021, Dow Inc. repurchased \$1.0 billion of the Company's common stock. At December 31, 2021, approximately \$1.4 billion of the share repurchase program authorization remained available for repurchases. As previously announced, the Company intends to, at a minimum, repurchase shares to cover dilution. The Company may expand share repurchases beyond dilution as favorable economic conditions develop. Any share repurchases, when coupled with the Company's dividends, is intended to implement the long-term strategy of ensuring shareholder remuneration is approximately 65 percent over the economic cycle.

Pension Plans

The Company has both funded and unfunded defined benefit pension plans that cover employees in the United States and a number of other countries. In 2021, 2020 and 2019, the Company contributed \$1,219 million, \$299 million and \$261 million to its continuing operations pension plans respectively, including contributions to fund benefit payments for its non-qualified pension plans (\$1,219 million, \$299 million and \$266 million, including contributions to plans of discontinued operations). In the first quarter of 2021, the Company elected to contribute \$1 billion to its U.S. tax-qualified pension plans, which is included in the 2021 contribution amount above. This contribution was based on the Company's funding policy, which is to contribute to defined benefit pension plans when pension laws and/or economics either require or encourage funding. The Company expects to contribute approximately \$180 million to its pension plans in 2022.

On March 4, 2021, the Company announced changes to the design of its U.S. tax-qualified and non-qualified pension plans (collectively, the "U.S. Plans") and, effective December 31, 2023, the Company will freeze the pensionable compensation and credited service amounts used to calculate pension benefits for employees who participate in the U.S. Plans. See Note 20 to the Consolidated Financial Statements for additional information concerning the Company's pension plans.

Restructuring

The actions related to the 2020 Restructuring Program are expected to result in additional cash expenditures of \$168 million, primarily through the third quarter of 2022, consisting of severance and related benefit costs and costs associated with exit and disposal activities, including contract cancellation penalties and environmental remediation. Restructuring implementation costs, primarily decommissioning and demolition activities related to asset actions, are expected to result in additional cash expenditures of approximately \$50 million, primarily through the third quarter of 2022. Restructuring implementation costs totaled \$63 million in 2021.

The Company expects to incur additional costs in the future related to its restructuring activities, which will be recognized as incurred. The Company also expects to incur additional employee-related costs, including involuntary termination benefits related to its other optimization activities. These costs cannot be reasonably estimated at this time. See Note 6 to the Consolidated Financial Statements for additional information on the Company's restructuring activities.

Digital Acceleration

In the first quarter of 2021, Dow announced plans to further advance and expand its digitalization efforts to deliver long-term value creation, by accelerating investment in three key areas: expanding digital tools to accelerate materials science innovation; further enhancing the e-commerce buying and fulfillment experience for Dow's customers; and adopting real-time digital manufacturing insights, operational data intelligence and demand sensing to enhance the productivity and reliability of Dow's operations. The Company expects more than \$300 million in incremental annual run rate Operating EBITDA generation by the end of 2025 related to digital acceleration, with an additional one-time \$100 million in structural working capital efficiency gains, driven in part by enhanced planning from digital tools. The activities related to digital acceleration are expected to result in additional cash expenditures of approximately \$250 million, primarily through the end of 2022. Digital acceleration expenses totaled \$169 million in 2021.

Contractual Obligations

The following table summarizes the Company's contractual obligations, commercial commitments and expected cash requirements for interest at December 31, 2021. Additional information related to these obligations can be found in Notes 15, 16, 17 and 20 to the Consolidated Financial Statements.

Contractual Obligations at Dec 31, 2021	Payments Due In				Total
	2022	2023-2024	2025-2026	2027 and beyond	
In millions					
Dow Inc.					
Long-term debt obligations ¹	\$ 231	\$ 464	\$ 1,213	\$ 12,900	\$ 14,808
Expected cash requirements for interest ²	631	1,207	1,149	7,409	10,396
Pension and other postretirement benefits	280	587	594	6,089	7,550
Operating leases ³	346	499	326	570	1,741
Purchase obligations ⁴	2,953	4,337	2,579	3,428	13,297
Other noncurrent obligations ⁵	—	910	677	1,391	2,978
Total	\$ 4,441	\$ 8,004	\$ 6,538	\$ 31,787	\$ 50,770
TDCC					
Long-term debt obligations ¹	\$ 231	\$ 464	\$ 1,213	\$ 12,900	\$ 14,808
Expected cash requirements for interest ²	631	1,207	1,149	7,409	10,396
Pension and other postretirement benefits	280	587	594	6,089	7,550
Operating leases ³	346	499	326	570	1,741
Purchase obligations ⁴	2,953	4,337	2,579	3,428	13,297
Other noncurrent obligations ⁵	—	884	578	1,368	2,830
Total	\$ 4,441	\$ 7,978	\$ 6,439	\$ 31,764	\$ 50,622

1. Excludes unamortized debt discount and issuance costs of \$297 million. Includes finance lease obligations of \$869 million.

2. Cash requirements for interest on long-term debt was calculated using current interest rates at December 31, 2021, and includes \$53 million of various floating rate notes.

3. Includes imputed interest of \$278 million.

4. Includes outstanding purchase orders and other commitments greater than \$1 million obtained through a survey conducted within the Company.

5. Includes liabilities related to asbestos litigation, environmental remediation, legal matters and other noncurrent liabilities. In addition to these items, Dow Inc. includes liabilities related to noncurrent obligations with DuPont and Corteva. The table excludes uncertain tax positions due to uncertainties in the timing of the effective settlement of tax positions with the respective taxing authorities and deferred tax liabilities as it is impractical to determine whether there will be a cash impact related to these liabilities. The table also excludes deferred revenue as it does not represent future cash requirements arising from contractual payment obligations.

The Company expects to meet its contractual obligations through its normal sources of liquidity and believes it has the financial resources to satisfy these contractual obligations.

Off-Balance Sheet Arrangements

Off-balance sheet arrangements are obligations the Company has with nonconsolidated entities related to transactions, agreements or other contractual arrangements. The Company holds variable interests in joint ventures accounted for under the equity method of accounting. The Company is not the primary beneficiary of these joint ventures and therefore is not required to consolidate these entities (see Note 24 to the Consolidated Financial Statements). In addition, see Note 14 to the Consolidated Financial Statements for information regarding the transfer of financial assets.

Guarantees arise during the ordinary course of business from relationships with customers, committed accounts receivable facilities and nonconsolidated affiliates when the Company undertakes an obligation to guarantee the performance of others if specific triggering events occur. Additional information related to guarantees can be found in the "Guarantees" section of Note 16 to the Consolidated Financial Statements.

Fair Value Measurements

See Note 20 to the Consolidated Financial Statements for information related to fair value measurements of pension and other postretirement benefit plan assets; see Note 22 for information related to other-than-temporary impairments; and, see Note 23 for additional information concerning fair value measurements.

OTHER MATTERS

Recent Accounting Guidance

See Note 2 to the Consolidated Financial Statements for a summary of recent accounting guidance.

Critical Accounting Estimates

The preparation of financial statements and related disclosures in accordance with U.S. GAAP requires management to make judgments, assumptions and estimates that affect the amounts reported in the consolidated financial statements and accompanying notes. Note 1 to the Consolidated Financial Statements describes the significant accounting policies and methods used in the preparation of the consolidated financial statements. Following are the Company's accounting policies impacted by judgments, assumptions and estimates:

Litigation

The Company is subject to legal proceedings and claims arising out of the normal course of business including product liability, patent infringement, employment matters, governmental tax and regulation disputes, contract and commercial litigation and other actions. The Company routinely assesses the legal and factual circumstances of each matter, the likelihood of any adverse outcomes to these matters, as well as ranges of probable losses. A determination of the amount of the reserves required, if any, for these contingencies is made after thoughtful analysis of each known claim. The Company has an active risk management program consisting of numerous insurance policies secured from many carriers covering various timeframes. These policies may provide coverage that could be utilized to minimize the financial impact, if any, of certain contingencies. The required reserves may change in the future due to new developments in each matter. For further discussion, see Note 16 to the Consolidated Financial Statements.

Asbestos-Related Matters of Union Carbide Corporation

Union Carbide is and has been involved in a large number of asbestos-related suits filed primarily in state courts during the past four decades. These suits principally allege personal injury resulting from exposure to asbestos-containing products and frequently seek both actual and punitive damages. The alleged claims primarily relate to products that Union Carbide sold in the past, alleged exposure to asbestos-containing products located on Union Carbide's premises, and Union Carbide's responsibility for asbestos suits filed against a former Union Carbide subsidiary, Amchem Products, Inc. ("Amchem"). Each year, Ankura Consulting Group, LLC ("Ankura") performs a review for Union Carbide based upon historical asbestos claims, resolution and asbestos-related defense and processing costs, through the terminal year of 2049. Union Carbide compares current asbestos claim and resolution activity, including asbestos-related defense and processing costs, to the results of the most recent Ankura study at each balance sheet date to determine whether the asbestos-related liability continues to be appropriate.

For additional information, see Part I, Item 3. Legal Proceedings; Asbestos-Related Matters of Union Carbide Corporation in Management's Discussion and Analysis of Financial Condition and Results of Operations; and Notes 1 and 16 to the Consolidated Financial Statements.

Environmental Matters

The Company determines the costs of environmental remediation of its facilities and formerly owned facilities based on evaluations of current law and existing technologies. Inherent uncertainties exist in such evaluations primarily due to unknown environmental conditions, changing governmental regulations and legal standards regarding liability, and emerging remediation technologies. The recorded liabilities are adjusted periodically as remediation efforts progress, or as additional technical or legal information becomes available. At December 31, 2021, the Company had accrued obligations of \$1,220 million for probable environmental remediation and restoration costs, including \$237 million for the remediation of Superfund sites. This is management's best estimate of the costs for remediation and restoration with respect to environmental matters for which the Company has accrued liabilities, although it is reasonably possible that the ultimate cost with respect to these particular matters could range up to approximately two times that amount. For further discussion, see Environmental Matters in Management's Discussion and Analysis of Financial Condition and Results of Operations and Notes 1 and 16 to the Consolidated Financial Statements.

Goodwill

The Company performs goodwill impairment testing at the reporting unit level. Reporting units are the level at which discrete financial information is available and reviewed by business management on a regular basis. The Company tests goodwill for impairment annually (in the fourth quarter), or more frequently when events or changes in circumstances indicate it is more likely than not that the fair value of a reporting unit has declined below its carrying value. Goodwill is evaluated for impairment using qualitative and/or quantitative testing procedures. The separation from DowDuPont on April 1, 2019, did not impact the composition of the Company's six reporting units: Coatings & Performance Monomers, Consumer Solutions, Hydrocarbons & Energy, Industrial Solutions, Packaging and Specialty Plastics and Polyurethanes & Construction Chemicals. The ECP businesses received as part of the separation from DowDuPont are included in the Hydrocarbons & Energy and Packaging and Specialty Plastics reporting units. At December 31, 2021, goodwill was carried by five out of six of the Company's reporting units.

The Company has the option to first perform qualitative testing to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. Qualitative factors assessed at the Company level include, but are not limited to, GDP growth rates, long-term hydrocarbon and energy prices, equity and credit market activity, discount rates, foreign exchange rates and overall financial performance. Qualitative factors assessed at the reporting unit level include, but are not limited to, changes in industry and market structure, competitive environments, planned capacity and new product launches, cost factors such as raw material prices, and financial performance of the reporting unit. If the Company chooses not to complete qualitative testing for a given reporting unit or if the initial assessment indicates that it is more likely than not that the estimated fair value of a reporting unit is less than its carrying value, additional quantitative testing is required.

Quantitative testing requires the fair value of the reporting unit to be compared with its carrying value. If the reporting unit's carrying value exceeds its fair value, an impairment charge is recognized for the difference. The Company utilizes a discounted cash flow methodology to calculate the fair value of its reporting units. This valuation technique has been selected by management as the most meaningful valuation method due to the limited number of market comparables for the Company's reporting units. However, where market comparables are available, the Company includes EBIT/EBITDA multiples as part of the reporting unit valuation analysis. The discounted cash flow valuations are completed using the following key assumptions: projected revenue growth rates or compounded annual growth rates, discount rates, tax rates, terminal values, currency exchange rates, and forecasted long-term hydrocarbon and energy prices, by geographic region and by year, which include the Company's key feedstocks as well as natural gas and crude oil (due to its correlation to naphtha). Currency exchange rates and long-term hydrocarbon and energy prices are established for the Company as a whole and applied consistently to all reporting units, while revenue growth rates, discount rates and tax rates are established by reporting unit to account for differences in business fundamentals and industry risk. These key assumptions drive projected EBIT/EBITDA and EBIT/EBITDA margins, which are key elements of management's internal control over the reporting unit valuation analysis.

2021 Goodwill Impairment Testing

In 2021, there were no events or changes in circumstances that warranted interim goodwill impairment testing. In the fourth quarter of 2021, qualitative testing was performed for all reporting units carrying goodwill. Based on the results of the qualitative testing, the Company did not perform quantitative testing on any reporting units. For the qualitative testing, management considered factors at both the Company level and the reporting unit level. Based on the qualitative testing for the reporting units, management concluded it is not more likely than not that the fair value of the reporting unit is less than the carrying value of the reporting unit.

Pension and Other Postretirement Benefits

The amounts recognized in the consolidated financial statements related to pension and other postretirement benefits are determined from actuarial valuations. Inherent in these valuations are assumptions including expected return on plan assets, discount rates at which the liabilities could have been settled at December 31, 2021, rate of increase in future compensation levels, mortality rates and health care cost trend rates. These assumptions are updated annually and are disclosed in Note 20 to the Consolidated Financial Statements. In accordance with U.S. GAAP, actual results that differ from the assumptions are accumulated and amortized over future periods and, therefore, affect expense recognized and obligations recorded in future periods. The U.S. pension plans represent 71 percent of the Company's pension plan assets and 70 percent of the pension obligations.

The Company uses the spot rate approach to determine the discount rate utilized to measure the service cost and interest cost components of net periodic pension and other postretirement benefit costs for the U.S. and other selected countries. Under the spot rate approach, the Company calculates service cost and interest cost by applying individual spot rates from the Willis Towers Watson RATE:Link yield curve (based on high-quality corporate bond yields) for each selected country to the separate expected cash flow components of service cost and interest cost; service cost and interest cost for all other plans (including all plans prior to adoption) are determined on the basis of the single equivalent discount rates derived in determining those plan obligations.

The following information relates to the U.S. plans only; a similar approach is used for the Company's non-U.S. plans.

The Company determines the expected long-term rate of return on assets by performing a detailed analysis of historical and expected returns based on the strategic asset allocation approved by the Company's Investment Committee and the underlying return fundamentals of each asset class. The Company's historical experience with the pension fund asset performance is also considered. The expected return of each asset class is derived from a forecasted future return confirmed by historical experience. The expected long-term rate of return is an assumption and not what is expected to be earned in any one particular year. The weighted-average long-term rate of return assumption used for determining net periodic pension expense for 2021 was 7.96 percent. The weighted-average assumption to be used for determining 2022 net periodic pension expense is 7.95 percent. Future actual pension expense will depend on future investment performance, changes in future discount rates and various other factors related to the population of participants in the Company's pension plans.

The discount rates utilized to measure the pension and other postretirement obligations of the U.S. plans are based on the yield on high-quality corporate fixed income investments at the measurement date. Future expected actuarially determined cash flows for the Company's U.S. plans are individually discounted at the spot rates under the Willis Towers Watson U.S. RATE:Link 60-90 corporate yield curve (based on 60th to 90th percentile high-quality corporate bond yields) to arrive at the plan's obligations as of the measurement date. The weighted average discount rate utilized to measure pension obligations increased to 3.04 percent at December 31, 2021, from 2.71 percent at December 31, 2020.

At December 31, 2021, the U.S. tax-qualified plans were underfunded on a projected benefit obligation basis by \$2,585 million. The underfunded amount decreased \$3,288 million compared with December 31, 2020. The decrease in the underfunded amount in 2021 was primarily due to the impact of higher discount rates, overall favorable asset returns, a \$1 billion contribution to the U.S. tax-qualified pension plans, and plan design changes.

The assumption for the long-term rate for compensation levels for the U.S. tax-qualified plans was unchanged. The Company uses a generational mortality table to determine the duration of its pension and other postretirement obligations.

The following discussion relates to the Company's significant pension plans.

The Company bases the determination of pension expense on a market-related valuation of plan assets that reduces year-to-year volatility. This market-related valuation recognizes investment gains or losses over a five-year period from the year in which they occur. Investment gains or losses for this purpose represent the difference between the expected return calculated using the market-related value of plan assets and the actual return based on the market value of plan assets. Since the market-related value of plan assets recognizes gains or losses over a five-year period, the future value will be impacted when previously deferred gains or losses are recorded. Over the life of the plans, both gains and losses have been recognized and amortized. At December 31, 2021, net gains of \$1,628 million remain to be recognized in the calculation of the market-related value of plan assets. These net gains will result in decreases in future pension expense as they are recognized in the market-related value of assets.

The net increase in the market-related value of assets due to the recognition of prior gains is presented in the following table:

Net Increase in Market-Related Asset Value Due to Recognition of Prior Gains	
In millions	
2022	\$ 329
2023	770
2024	377
2025	152
Total	\$ 1,628

Exclusive of one-time curtailment gains recognized in 2021, the Company expects pension expense to decrease in 2022 by approximately \$25 million. The decrease is driven by a reduction in the amortization of actuarial losses.

A 25 basis point increase or decrease in the long-term return on assets assumption would change the Company's total pension expense for 2022 by \$62 million. A 25 basis point increase in the discount rate assumption would decrease the Company's total pension expense for 2022 by \$53 million. A 25 basis point decrease in the discount rate assumption would increase the Company's total pension expense for 2022 by \$55 million. A 25 basis point change in the long-term return and discount rate assumptions would have an immaterial impact on the other postretirement benefit expense for 2022.

Income Taxes

Deferred tax assets and liabilities are determined based on temporary differences between the financial reporting and tax bases of assets and liabilities, applying enacted tax rates expected to be in effect for the year in which the differences are expected to reverse. Based on the evaluation of available evidence, both positive and negative, the Company recognizes future tax benefits, such as net operating loss carryforwards and tax credit carryforwards, to the extent that realizing these benefits is considered to be more likely than not.

At December 31, 2021, the Company had a net deferred tax asset balance of \$852 million, after valuation allowances of \$1,391 million.

In evaluating the ability to realize the deferred tax assets, the Company relies on, in order of increasing subjectivity, taxable income in prior carryback years, the future reversals of existing taxable temporary differences, tax planning strategies and forecasted taxable income using historical and projected future operating results.

At December 31, 2021, the Company had deferred tax assets for tax loss and tax credit carryforwards of \$1,784 million, \$864 million of which is subject to expiration in the years 2022 through 2026. In order to realize the deferred tax assets for operating tax loss and tax credit carryforwards, the Company needs taxable income of approximately \$25,034 million across multiple jurisdictions. The taxable income needed to realize the deferred tax assets for operating tax loss and tax credit carryforwards that are subject to expiration from 2022 through 2026 is approximately \$14,748 million.

The Company files tax returns in multiple jurisdictions and is subject to examination by taxing authorities throughout the world. Tax authorities have the ability to review and challenge matters that could be subject to differing interpretation of applicable tax laws and regulations as they relate to the amount, character, timing or inclusion of revenue and expenses or the sustainability of tax attributes. The ultimate resolution of such uncertainties could last

several years. When an uncertain tax position is identified, the Company considers and interprets complex tax laws and regulations in order to determine the need for recognizing a provision in its financial statements. Significant judgment is required in determining the timing and measurement of uncertain tax positions. The Company utilizes internal and external expertise in interpreting tax laws to support the Company's tax positions. The Company recognizes the financial statement effects of an uncertain income tax position when it is more likely than not, based on technical merits, that the position will be sustained upon examination. At December 31, 2021, the Company had uncertain tax positions for both domestic and foreign issues of \$580 million and \$502 million for interest and penalties.

Environmental Matters

Environmental Policies

Dow is committed to world-class environmental, health and safety ("EH&S") performance, as demonstrated by industry-leading performance, a long-standing commitment to Responsible Care®, and a strong commitment to achieve the Company's 2025 Sustainability Goals – goals that set the standard for sustainability in the chemical industry by focusing on improvements in the Company's local corporate citizenship and product stewardship, and by actively pursuing methods to reduce its environmental impact.

To meet the Company's public commitments, as well as the stringent laws and government regulations related to environmental protection and remediation to which its global operations are subject, the Company has well-defined policies, requirements and management systems. The Company's EH&S Management System ("EMS") defines the "who, what, when and how" needed for the businesses to achieve the Company's policies, requirements, performance objectives, leadership expectations and public commitments. To ensure effective utilization, the EMS is integrated into a company-wide management system for EH&S, Operations, Quality and Human Resources.

The Company believes third-party verification and transparent public reporting are cornerstones of world-class EH&S performance and building public trust. Numerous Dow sites in Europe, Latin America, Asia Pacific and the U.S. & Canada have received third-party verification of the Company's compliance with Responsible Care® and with outside specifications such as ISO-14001. The Company continues to be a global champion of Responsible Care® and has worked to broaden the application and impact of Responsible Care® around the world through engagement with suppliers, customers and joint venture partners.

Dow's EH&S policies help to ensure the Company achieves its annual health and safety performance targets and the Company seeks to continuously improve on these targets through process and personal safety project implementations. Improvement in these areas, as well as environmental compliance, remains a top management priority, as the Company continues to implement its 2025 Sustainability Goals and progressive, multi-decade sustainability targets announced in 2020 that include advancing a circular economy and climate protection. Progress is reviewed regularly by management and with the Environment, Health, Safety & Technology Committee of the Board.

Detailed information on Dow's performance regarding environmental matters and goals is accessible through the Company's Science & Sustainability webpage at www.dow.com/sustainability. Dow's website and its content are not deemed incorporated by reference into this report.

Chemical Security

Public and political attention continues to be placed on the protection of critical infrastructure, including the chemical industry, from security threats. Terrorist attacks, natural disasters and cyber incidents have increased global concerns about the security and safety of chemical production and distribution. Many, including the Company and the American Chemistry Council, have called for uniform risk-based and performance-based national standards for securing the U.S. chemical industry. U.S. regulations set forth risk-based and performance-based standards that must be met at U.S. Coast Guard-regulated facilities. The Company is subject to U.S. Chemical Plant Security regulations and Chemical Facility Anti-Terrorism Standards which were implemented by the U.S. Department of Homeland Security. The Company is also subject to the requirements of the Rail Transportation Security Rule issued by the U.S. Transportation Security Administration. The Company continues to support uniform risk-based national standards for securing the chemical industry.

Since 1988, the Company has maintained a comprehensive, multi-level security plan that focuses on security, emergency planning, preparedness and response. This plan, which has been activated in response to significant world and national events, is reviewed on an annual basis. The Company continues to improve its security plans, placing emphasis on the safety of Dow communities and people by being prepared to meet risks at any level and to

address both internal and external identifiable risks. The security plan includes regular vulnerability assessments, security audits, mitigation efforts and physical security upgrades designed to reduce vulnerability. The Company's security plans are also designed to avert interruptions of normal business operations that could materially and adversely affect the Company's results of operations, financial condition and cash flows.

The Company played a key role in the development and implementation of the American Chemistry Council's Responsible Care® Security Code ("Security Code"), which requires that all aspects of security – including facility, transportation and cyberspace – be assessed and gaps addressed. Through the global implementation of the Security Code, the Company has permanently heightened the level of security – not just in the United States, but worldwide. The Company employs several hundred employees and contractors in its Emergency Services and Security department worldwide. In 2019, the Company established its Global Security Operations Center ("GSOC") to provide 24-hour/day, 365-day/year real-time monitoring of global risks to Dow assets and people. The GSOC employs state-of-the-art social media monitoring, threat reporting and geo-fencing capabilities to analyze global risks and report those risks, facilitating decision-making and actions to prevent Dow crises.

Through the implementation of the Security Code, including voluntary security enhancements and upgrades, the Company is well-positioned to comply with U.S. chemical facility regulations and other regulatory security frameworks. The Company participates with the American Chemistry Council to periodically review and update the Security Code.

The Company continues to work collaboratively across the supply chain on Responsible Care®, supply chain design, emergency preparedness, shipment visibility and transportation of hazardous materials. The Company cooperated with public and private entities to lead the implementation of advanced tank car design, and track and trace technologies. Further, the Company's Distribution Risk Review process addresses potential threats in all modes of transportation across the Company's supply chain. To reduce vulnerabilities, the Company maintains security measures that meet or exceed regulatory and industry security standards in all areas in which they operate.

The Company's initiatives relative to chemical security, emergency preparedness and response, Community Awareness and Emergency Response and crisis management are implemented consistently at all Dow sites on a global basis. Each Dow site has established outreach programs designed to engage community stakeholders with objectives centered around awareness of Dow operations, products, and efforts to protect worker and community health and the environment. These programs also educate community members on emergency planning and response, emissions and waste, future site plans to reduce waste and emissions, and process safety systems. Finally, these outreach efforts establish an opportunity for Dow site leaders to hear about community stakeholder expectations and address questions and concerns about safety, health, environmental or other issues. The Company participates with chemical associations globally and participates as an active member of the U.S. delegation to the G7 Global Partnership Sub-Working Group on Chemical Security and in positions of leadership in the U.S. Chemical Sector Coordinating Council.

Climate Change

Climate change matters for the Company are likely to be driven by several categories of risks related to the transition to a lower-carbon economy ("Transition Risks") and risks related to the physical impacts of climate change ("Physical Risks").

Transition Risks

Transition Risks include carbon pricing mechanisms, transition to lower greenhouse gas emissions technology, increased cost of raw materials, and mandates on and regulation of existing products and services. Carbon pricing is a market-based strategy to address climate change by putting a monetary value on greenhouse gas emissions, allowing for the costs of climate impacts and opportunities for low-carbon energy options to be reflected in production and consumption choices. Approximately 35 percent of Dow's Scope 1 and 2 greenhouse gas emissions are generated from operations in Canada and the European Union ("EU") where carbon pricing is already in place. As part of the European Green Deal, the European Commission proposed a 2030 greenhouse gas emissions reduction target of at least 55 percent below 1990 levels, with a goal for the EU to be carbon neutral by 2050. In China, an emissions trading system, initially proposed to cover the power sector only, is expected to gradually expand to cover a total of eight sectors, including the petrochemical and chemical industries, though no specific timeline for implementation and expansion has been outlined.

These carbon pricing mechanisms will not only increase Dow's direct costs to operate but will also result in increased energy costs. Dow mitigates the direct cost impact of existing regulation through research and

development projects designed to increase energy efficiency, and capital investment projects that will reduce the Company's energy usage and carbon footprint. The Company is also exploring options for carbon capture, utilization and storage ("CCUS") and electrification of Dow's processes. Dow sees CCUS as a mechanism to help bridge the time period between the onset of increased carbon regulation and the technology available to economically reduce Dow's greenhouse gas emissions. Dow also incorporates a theoretical internal carbon price into its business planning and risk management strategies. This theoretical price of carbon is also included in internal calculations used for prioritizing capital projects. Ultimately the goal of utilizing an internal carbon price is to mitigate the risk of Dow's carbon exposure to help ensure future resiliency.

Physical Risks

Operationally, climate change may result in more frequent severe weather events, potential changes in precipitation patterns and extreme variability in weather patterns, which can disrupt operations. Several of Dow's production facilities are located in water-scarce areas and water shortages could impact normal production. Changes in average precipitation could have an impact on the availability and price of water. The Company has engineered susceptible facilities, particularly on the U.S. Gulf Coast, to better withstand severe weather and rising sea levels, and continues to study the long-term implications of changing climate parameters on water availability, plant siting issues and other impacts. Preparedness plans are developed that detail actions needed in the event of severe weather. These measures have historically been in place and these activities and associated costs are driven by normal operational preparedness.

Climate Action

The transition to a low-carbon economy remains one of society's fundamental challenges. The Company continues to progress toward its defined 2025 Sustainability Goals, which are the foundation of Dow's efforts to help lead the transition to a sustainable planet and society, and is taking further action to lessen its carbon impact moving forward. In 2020, the Company announced a new, multi-decade target to reduce its net annual greenhouse gas emissions by 5 million metric tons by 2030, compared with its 2020 baseline, a reduction of approximately 15 percent, and announced its intention to be carbon neutral by 2050 (Scopes 1+2+3, as defined by the Greenhouse Gas Protocol, plus product benefits).

To achieve the 2030 carbon reduction target, Dow developed a climate protection action plan which includes the following elements:

- Optimizing energy efficiency of facilities and processes
- Increasing renewables in purchased power mix
- Investments in CCUS
- Developing low-carbon technologies for emission reductions
- Deploying materials to enable greenhouse gas emissions reductions for customers and industries

The action plan has resulted in new and expanded renewable power purchase agreements. In 2020, Dow increased its existing access to renewable power by more than 50 percent, to over 800 megawatts of renewable power, exceeding its 2025 Sustainability Goal target of 750 megawatts. The Company also initiated a joint development agreement with Shell to develop electrified cracking technology, powered by clean energy.

In 2021, Dow announced additional renewable and cleaner power agreements that increase Dow's access to over 850 megawatts of renewable power and are expected to reduce Scope 2 emissions by more than 600,000 metric tons of carbon dioxide equivalent per year. Dow also announced a plan to build the world's first net-zero carbon emissions (with respect to Scope 1 and 2 carbon dioxide emissions, including technology advancements) site in Alberta, Canada, which will decarbonize 20 percent of Dow's global ethylene capacity while growing polyethylene supply, with expected completion by 2030. At Dow's largest European manufacturing site in Terneuzen, The Netherlands, the Company has outlined a multi-generational plan to reduce current carbon emissions at the site by more than 40 percent by 2030, as part of the Company's goal to reduce Company-wide carbon emissions an additional 15 percent by 2030, and to be carbon neutral by 2050. Other steps the Company will take to achieve its 2030 greenhouse gas emissions reduction target include: procuring more renewable energy at multiple sites, modernizing Louisiana Operations energy assets, completing U.S. Gulf Coast flare recovery projects and advancing silicones feedstock capabilities in Brazil. The Company expects to allocate approximately \$1 billion of capital expenditures annually to decarbonize its global asset base in a phased, site-by-site approach while driving growth.

The Task Force on Climate-related Financial Disclosures (“TCFD”) has developed a framework to help organizations more effectively disclose climate-related risks and opportunities through existing reporting processes. Dow’s 2020 ESG Report includes disclosures aligned to the TCFD framework, which includes four core pillars: governance, strategy, risk management, and metrics and targets. The Company intends to meet its commitment to fully implement the recommendations of the TCFD as part of the Company’s 2021 ESG Report, to be published in 2022.

Advancing a Circular Economy

Transitioning to a circular economy is vital to both preserving and protecting Earth’s natural resources and to the success of Dow’s businesses. To help advance a circular economy, Dow invests in new product technology, value chain partnerships, business models and waste management infrastructure to discover and scale sustainable solutions that extend the useful life of materials and the resources that are used to make them. In 2020, Dow announced “stop the waste” and “close the loop” goals to address plastic waste.

Dow’s “stop the waste” goal is the Company’s commitment to invest and/or collaborate in key technologies and infrastructure to significantly increase global recycling. As part of this goal, Dow intends to enable 1 million metric tons of plastic to be collected, reused or recycled through direct actions and partnerships by 2030. Dow will further “stop the waste” through application development, where more recycled plastics can be incorporated into key applications; through critical partnerships such as Circulate Capital and the Alliance to End Plastic Waste; and through incorporating waste into advanced recycling technologies.

Dow continues to look for market applications for recycled plastics to keep plastic out of landfills. One way to help stop the flow of this waste is to use recycled polymer modified asphalt for roads, parking lots, and other pavement. Polymer modified asphalt (“PMA”) is a proven solution for making better pavement. Dow’s ELVALOY™ Reactive Elastomeric Terpolymer products have been enhancing PMAs for more than 30 years, resulting in excellent performance, long service life, and lower life cycle costs compared to conventional, neat asphalt.

Dow’s “close the loop” goal is the Company’s commitment to work directly with its customers, brand owners and the value chain to help customers redesign and promote reusable or recyclable packaging applications where there is a clear environmental benefit and enable 100 percent of Dow products sold into packaging applications to be reusable or recyclable by 2035. Today, Dow enables approximately 80 percent of its products sold into packaging applications to be reusable or recyclable and continues to pursue application development, packaging redesign and infrastructure improvements to deliver on the Company’s 100 percent commitment.

As one of the world’s largest producers of plastic, Dow wants to put an end to plastic waste. Eliminating plastic waste is about more than just recycling and reusing. It is about creating innovative solutions that are sustainable and investing in the circular economy through recyclability and efficiency for plastic packaging. Dow aims to keep plastic waste out of the environment and retain its value as a resource by increasing impact through partnerships and delivering circular economy solutions.

Environmental Remediation

The Company accrues the costs of remediation of its facilities and formerly owned facilities based on current law and regulatory requirements. The nature of such remediation can include management of soil and groundwater contamination. The accounting policies adopted to properly reflect the monetary impacts of environmental matters are discussed in Note 1 to the Consolidated Financial Statements. To assess the impact on the financial statements, environmental experts review currently available facts to evaluate the probability and scope of potential liabilities. Inherent uncertainties exist in such evaluations primarily due to unknown environmental conditions, changing governmental regulations and legal standards regarding liability, and the ability to apply remediation technologies. These liabilities are adjusted periodically as remediation efforts progress or as additional technical or legal information becomes available. The Company had an accrued liability of \$983 million at December 31, 2021, related to the remediation of current or former Dow-owned sites. At December 31, 2020, the liability related to remediation was \$996 million.

In addition to current and former Dow-owned sites, under the federal Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") and equivalent state laws (hereafter referred to collectively as "Superfund Law"), the Company is liable for remediation of other hazardous waste sites where the Company allegedly disposed of, or arranged for the treatment or disposal of, hazardous substances. Because Superfund Law imposes joint and several liability upon each party at a site, the Company has evaluated its potential liability in light of the number of other companies that have also been named potentially responsible parties ("PRPs") at each site, the estimated apportionment of costs among all PRPs, and the financial ability and commitment of each to pay its expected share. The Company's remaining liability for the remediation of Superfund sites was \$237 million at December 31, 2021 (\$248 million at December 31, 2020). The Company has not recorded any third-party recovery related to these sites as a receivable.

Information regarding environmental sites is provided below:

Environmental Sites	Dow-owned Sites ¹		Superfund Sites ²	
	2021	2020	2021	2020
Number of sites at Jan 1	185	178	132	133
Sites added during year	2	7	5	—
Sites closed during year	(16)	—	(3)	(1)
Number of sites at Dec 31	171	185	134	132

1. Dow-owned sites are sites currently or formerly owned by the Company. In the United States, remediation obligations are imposed by the Resource Conservation and Recovery Act or analogous state law. At December 31, 2021, 24 of these sites (24 sites at December 31, 2020) were formerly owned by Dowell Schlumberger, Inc., a group of companies in which the Company previously owned a 50 percent interest. The Company sold its interest in Dowell Schlumberger in 1992.

2. Superfund sites are sites, including sites not owned by the Company, where remediation obligations are imposed by Superfund Law.

Additional information is provided below for the Company's Midland, Michigan, manufacturing site and Midland off-site locations (collectively, the "Midland sites"), as well as a Superfund site in Wood-Ridge, New Jersey, the locations for which the Company has the largest potential environmental liabilities.

In the early days of operations at the Midland manufacturing site, wastes were usually disposed of on-site, resulting in soil and groundwater contamination, which has been contained and managed on-site under a series of Resource Conservation and Recovery Act permits and regulatory agreements. The Hazardous Waste Operating License for the Midland manufacturing site, issued in 2003, and renewed and replaced in September 2015, also included provisions for the Company to conduct an investigation to determine the nature and extent of off-site contamination from historic Midland manufacturing site operations. In January 2010, the Company, the U.S. Environmental Protection Agency ("EPA") and the State of Michigan ("State") entered into an Administrative Order on Consent that requires the Company to conduct a remedial investigation, a feasibility study and a remedial design for the Tittabawassee River, the Saginaw River and the Saginaw Bay, and pay the oversight costs of the EPA and the State under the authority of CERCLA. See Note 16 to the Consolidated Financial Statements for further information relating to Midland off-site environmental matters.

Rohm and Haas, a wholly owned subsidiary of the Company, is a PRP at the Wood-Ridge, New Jersey Ventron/Velsicol Superfund Site, and the adjacent Berry's Creek Study Area ("BCSA") (collectively, the "Wood-Ridge sites"). Rohm and Haas is a successor in interest to a company that owned and operated a mercury processing facility, where wastewater and waste handling resulted in contamination of soils and adjacent creek sediments. In 2018, the Berry's Creek Study Area Potentially Responsible Party Group ("PRP Group"), consisting of over 100 PRPs, completed a Remedial Investigation/Feasibility Study for the BCSA. During that time, the EPA concluded that an "iterative or adaptive approach" was appropriate for cleaning up the BCSA. Thus, each phase of remediation will be followed by a period of monitoring to assess its effectiveness and determine if there is a need for more work. In September 2018, the EPA signed a Record of Decision ("ROD 1") which describes the initial phase of the EPA's plan to clean-up the BCSA. ROD 1 will remediate waterways and major tributaries in the most contaminated part of the BCSA. The PRP Group has signed agreements with the EPA to design the selected remedy. Although there is currently much uncertainty as to what will ultimately be required to remediate the BCSA and Rohm and Haas's share of these costs has yet to be determined, the range of activities that are required in the interim Record of Decision is known in general terms.

At December 31, 2021, the Company had accrued liabilities totaling \$358 million (\$370 million at December 31, 2020) for environmental remediation at the Midland and Wood-Ridge sites. In 2021, the Company spent \$38 million (\$53 million in 2020) for environmental remediation at the Midland and Wood-Ridge sites.

During the third quarter of 2020, the Company accrued additional liabilities totaling \$106 million related to environmental remediation matters resulting from the Company's evaluation of the costs required to manage remediation activities at sites Dow will permanently shut down as part of its 2020 Restructuring Program. In addition, the Company recorded indemnification assets of \$50 million related to Dow Silicones' environmental matters. Net of indemnifications, the Company recognized a pretax charge of \$56 million related to these environmental matters, included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income.

During the third quarter of 2019, the Company accrued additional liabilities totaling \$447 million related to environmental remediation matters at a number of current and historical locations. The additional accrual primarily resulted from: the culmination of long-standing negotiations and discussions with regulators and agencies, including technical studies supporting higher cost estimates for final or staged remediation plans; the Company's evaluation of the cost required to manage remediation activities at sites affected by Dow's separation from DowDuPont and related agreements with Corteva and DuPont; and, the Company's review of its closure strategies and obligations to monitor ongoing operations and maintenance activities. In addition, the Company recorded indemnification assets of \$48 million related to Dow Silicones' environmental matters. Net of indemnifications, the Company recognized a pretax charge of \$399 million related to these environmental matters, included in "Cost of sales" in the consolidated statements of income.

In total, the Company's accrued liability for probable environmental remediation and restoration costs was \$1,220 million at December 31, 2021, compared with \$1,244 million at December 31, 2020. This is management's best estimate of the costs for remediation and restoration with respect to environmental matters for which the Company has accrued liabilities, although it is reasonably possible that the ultimate cost with respect to these particular matters could range up to approximately two times that amount. Consequently, it is reasonably possible that environmental remediation and restoration costs in excess of amounts accrued could have a material impact on the Company's results of operations, financial condition and cash flows. It is the opinion of the Company's management, however, that the possibility is remote that costs in excess of the range disclosed will have a material impact on the Company's results of operations, financial condition and cash flows.

The amounts charged to income on a pretax basis related to environmental remediation totaled \$158 million in 2021, \$234 million in 2020 and \$588 million in 2019. The amounts charged to income on a pretax basis related to operating the Company's current pollution abatement facilities, excluding internal recharges, totaled \$761 million in 2021, \$616 million in 2020 and \$677 million in 2019. Capital expenditures for environmental protection were \$65 million in 2021, \$80 million in 2020 and \$83 million in 2019.

Asbestos-Related Matters of Union Carbide Corporation

Union Carbide is and has been involved in a large number of asbestos-related suits filed primarily in state courts during the past four decades. These suits principally allege personal injury resulting from exposure to asbestos-containing products and frequently seek both actual and punitive damages. The alleged claims primarily relate to products that Union Carbide sold in the past, alleged exposure to asbestos-containing products located on Union Carbide's premises, and Union Carbide's responsibility for asbestos suits filed against a former Union Carbide subsidiary, Amchem. In many cases, plaintiffs are unable to demonstrate that they have suffered any compensable loss as a result of such exposure, or that injuries incurred in fact resulted from exposure to Union Carbide's products.

The table below provides information regarding asbestos-related claims pending against Union Carbide and Amchem based on criteria developed by Union Carbide and its external consultants:

Asbestos-Related Claim Activity	<i>2021</i>	<i>2020</i>	<i>2019</i>
Claims unresolved at Jan 1	9,126	11,117	12,780
Claims filed	4,233	4,857	5,743
Claims settled, dismissed or otherwise resolved	(4,612)	(6,848)	(7,406)
Claims unresolved at Dec 31	8,747	9,126	11,117
Claimants with claims against both Union Carbide and Amchem	(2,139)	(2,904)	(3,837)
Individual claimants at Dec 31	6,608	6,222	7,280

Plaintiffs' lawyers often sue numerous defendants in individual lawsuits or on behalf of numerous claimants. As a result, the damages alleged are not expressly identified as to Union Carbide, Amchem or any other particular defendant, even when specific damages are alleged with respect to a specific disease or injury. In fact, there are no asbestos personal injury cases in which only Union Carbide and/or Amchem are the sole named defendants. For these reasons and based upon Union Carbide's litigation and settlement experience, Union Carbide does not consider the damages alleged against Union Carbide and Amchem to be a meaningful factor in its determination of any potential asbestos-related liability.

For additional information see Part I, Item 3. Legal Proceedings and Asbestos-Related Matters of Union Carbide Corporation in Note 16 to the Consolidated Financial Statements.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

The Company's business operations give rise to market risk exposure due to changes in foreign exchange rates, interest rates, commodity prices and other market factors such as equity prices. To manage such risks effectively, the Company enters into hedging transactions, pursuant to established guidelines and policies that enable it to mitigate the adverse effects of financial market risk. Derivatives used for this purpose are designated as hedges per the accounting guidance related to derivatives and hedging activities, where appropriate. A secondary objective is to add value by creating additional non-specific exposure within established limits and policies; derivatives used for this purpose are not designated as hedges. The potential impact of creating such additional exposures is not material to the Company's results.

The global nature of the Company's business requires active participation in the foreign exchange markets. The Company has assets, liabilities and cash flows in currencies other than the U.S. dollar. The primary objective of the Company's foreign currency risk management is to optimize the U.S. dollar value of net assets and cash flows. To achieve this objective, the Company hedges on a net exposure basis using foreign currency forward contracts, over-the-counter option contracts, cross-currency swaps and nonderivative instruments in foreign currencies. Exposures primarily relate to assets, liabilities and bonds denominated in foreign currencies, as well as economic exposure, which is derived from the risk that currency fluctuations could affect the dollar value of future cash flows related to operating activities. The largest exposures are denominated in European currencies, the Chinese yuan, the Japanese yen and the Thai baht, although exposures also exist in other currencies in Asia Pacific, Canada, Latin America, the Middle East, Africa and India.

The main objective of interest rate risk management is to reduce the total funding cost to the Company and to alter the interest rate exposure to the desired risk profile. To achieve this objective, the Company hedges using interest rate swaps, "swaptions," and exchange-traded instruments. The Company's primary exposure is to the U.S. dollar yield curve.

The Company has a portfolio of equity securities derived primarily from the investment activities of its insurance subsidiaries. This exposure is managed in a manner consistent with the Company's market risk policies and procedures.

Inherent in the Company's business is exposure to price changes for several commodities. Some exposures can be hedged effectively through liquid tradable financial instruments. Natural gas and crude oil, along with feedstocks for ethylene and propylene production, constitute the main commodity exposures. Over-the-counter and exchange traded instruments are used to hedge these risks, when feasible.

The Company uses value-at-risk ("VAR"), stress testing and scenario analysis for risk measurement and control purposes. VAR estimates the maximum potential loss in fair market values, given a certain move in prices over a certain period of time, using specified confidence levels. The VAR methodology used by the Company is a variance/covariance model. This model uses a 97.5 percent confidence level and includes at least one year of historical data. The 2021 and 2020 year-end and average daily VAR for the aggregate of all positions are shown below. These amounts are immaterial relative to the total equity of the Company.

Total Daily VAR by Exposure Type at Dec 31	<i>2021</i>		<i>2020</i>	
	<i>Year-end</i>	<i>Average</i>	<i>Year-end</i>	<i>Average</i>
In millions				
Commodities	\$ 26	\$ 17	\$ 23	\$ 19
Equity securities	7	11	18	17
Foreign exchange	24	15	11	15
Interest rate	143	112	142	153
Composite	\$ 200	\$ 155	\$ 194	\$ 204

The Company's daily VAR for the aggregate of all positions increased from a composite VAR of \$194 million at December 31, 2020 to a composite VAR of \$200 million at December 31, 2021. The interest rate VAR increased due to an increase in interest rate exposure. The equity securities VAR decreased due to a decrease in equity volatility and a decrease in equity exposure. The foreign exchange VAR increased due to an increase in managed exposures. The commodities VAR increased due to an increase in managed exposures. See Note 22 to the Consolidated Financial Statements for further disclosure regarding market risk.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Dow Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Dow Inc. and subsidiaries (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of income, comprehensive income, equity, and cash flows, for each of the three years in the period ended December 31, 2021, and the related notes and the schedule listed in the Index at Item 15(a)(2) (collectively referred to as the "financial statements"). In our opinion, the financial statements 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.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), 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 and our report dated February 4, 2022, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the 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 audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinions on the critical audit matter or on the accounts or disclosures to which it relates.

Uncertain Tax Positions — Refer to Notes 1 and 8 to the financial statements

Critical Audit Matter Description

The Company has a complex legal structure involving numerous domestic and foreign locations with constantly changing tax laws, regulations, and legal interpretations. The Company's management is required to interpret and apply these tax laws and regulations in determining the amount of its income tax liability and provision. When an uncertain tax position is identified by management, the Company must evaluate if it is more likely than not, based on the technical merits, that the uncertain tax position will be sustained upon examination. The Company recognizes a benefit for tax positions using the highest cumulative tax benefit that is more likely than not to be realized. The Company establishes a liability for unrecognized tax benefits that do not meet this threshold. The

evaluation of each uncertain tax position requires management to apply specialized skill, knowledge, and significant judgment related to the identified position. The Company's liability for unrecognized tax benefits and related accrued interest and penalties as of December 31, 2021 was \$580 million and \$502 million, respectively.

Because of the complexity of tax laws, regulations and legal interpretations relevant to numerous taxing jurisdictions in which the Company operates, auditing uncertain tax positions and the determination of whether the more likely than not threshold was met requires a high degree of auditor judgment and increased extent of effort, including the involvement of our income tax specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to uncertain tax positions included the following, among others:

- We tested the effectiveness of internal controls over income taxes, including those over identifying uncertain tax positions and measuring liabilities.
- We evaluated, with the assistance of our income tax specialists, the Company's uncertain tax positions by performing the following:
 - Obtaining Company and third-party opinions or memoranda regarding the uncertain tax positions.
 - Identifying key judgements underlying the Company's position and evaluating whether the conclusions are consistent with our interpretation of the relevant laws and regulations.
 - Evaluating the Company's method of measuring its liability for unrecognized tax benefits, including underlying data and assumptions.
 - Evaluating the basis for certain intercompany transactions, such as transfer pricing, by comparison to economic studies performed by management and third-party data.
 - Evaluating matters raised by taxing authorities in former and ongoing tax audits.
 - Assessing changes and interpretation of applicable tax law.

/s/ DELOITTE & TOUCHE LLP

Midland, Michigan

February 4, 2022

We have served as the Company's auditor since 1905.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholder and the Board of Directors of The Dow Chemical Company

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of The Dow Chemical Company and subsidiaries (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of income, comprehensive income, equity, and cash flows, for each of the three years in the period ended December 31, 2021, and the related notes and the schedule listed in the Index at Item 15(a)(2) (collectively referred to as the "financial statements"). In our opinion, the financial statements 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.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), 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 and our report dated February 4, 2022, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the 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 audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinions on the critical audit matter or on the accounts or disclosures to which it relates.

Uncertain Tax Positions — Refer to Notes 1 and 8 to the financial statements

Critical Audit Matter Description

The Company has a complex legal structure involving numerous domestic and foreign locations with constantly changing tax laws, regulations, and legal interpretations. The Company's management is required to interpret and apply these tax laws and regulations in determining the amount of its income tax liability and provision. When an uncertain tax position is identified by management, the Company must evaluate if it is more likely than not, based on the technical merits, that the uncertain tax position will be sustained upon examination. The Company recognizes a benefit for tax positions using the highest cumulative tax benefit that is more likely than not to be realized. The Company establishes a liability for unrecognized tax benefits that do not meet this threshold. The evaluation of each uncertain tax position requires management to apply specialized skill, knowledge, and significant

judgment related to the identified position. The Company's liability for unrecognized tax benefits and related accrued interest and penalties as of December 31, 2021 was \$580 million and \$502 million, respectively.

Because of the complexity of tax laws, regulations and legal interpretations relevant to numerous taxing jurisdictions in which the Company operates, auditing uncertain tax positions and the determination of whether the more likely than not threshold was met requires a high degree of auditor judgment and increased extent of effort, including the involvement of our income tax specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to uncertain tax positions included the following, among others:

- We tested the effectiveness of internal controls over income taxes, including those over identifying uncertain tax positions and measuring liabilities.
- We evaluated, with the assistance of our income tax specialists, the Company's uncertain tax positions by performing the following:
 - Obtaining Company and third-party opinions or memoranda regarding the uncertain tax positions.
 - Identifying key judgements underlying the Company's position and evaluating whether the conclusions are consistent with our interpretation of the relevant laws and regulations.
 - Evaluating the Company's method of measuring its liability for unrecognized tax benefits, including underlying data and assumptions.
 - Evaluating the basis for certain intercompany transactions, such as transfer pricing, by comparison to economic studies performed by management and third-party data.
 - Evaluating matters raised by taxing authorities in former and ongoing tax audits.
 - Assessing changes and interpretation of applicable tax law.

/s/ DELOITTE & TOUCHE LLP

Midland, Michigan
February 4, 2022

We have served as the Company's auditor since 1905.

Dow Inc. and Subsidiaries
Consolidated Statements of Income

(In millions, except per share amounts) For the years ended Dec 31,	2021	2020	2019
Net sales	\$ 54,968	\$ 38,542	\$ 42,951
Cost of sales	44,191	33,346	36,657
Research and development expenses	857	768	765
Selling, general and administrative expenses	1,645	1,471	1,590
Amortization of intangibles	388	401	419
Restructuring, goodwill impairment and asset related charges - net	6	708	3,219
Integration and separation costs	—	239	1,063
Equity in earnings (losses) of nonconsolidated affiliates	975	(18)	(94)
Sundry income (expense) - net	(35)	1,269	461
Interest income	55	38	81
Interest expense and amortization of debt discount	731	827	933
Income (loss) from continuing operations before income taxes	8,145	2,071	(1,247)
Provision for income taxes on continuing operations	1,740	777	470
Income (loss) from continuing operations, net of tax	6,405	1,294	(1,717)
Income from discontinued operations, net of tax	—	—	445
Net income (loss)	6,405	1,294	(1,272)
Net income attributable to noncontrolling interests	94	69	87
Net income (loss) available for Dow Inc. common stockholders	\$ 6,311	\$ 1,225	\$ (1,359)

Per common share data:			
Earnings (loss) per common share from continuing operations - basic	\$ 8.44	\$ 1.64	\$ (2.42)
Earnings per common share from discontinued operations - basic	—	—	0.58
Earnings (loss) per common share - basic	\$ 8.44	\$ 1.64	\$ (1.84)
Earnings (loss) per common share from continuing operations - diluted	\$ 8.38	\$ 1.64	\$ (2.42)
Earnings per common share from discontinued operations - diluted	—	—	0.58
Earnings (loss) per common share - diluted	\$ 8.38	\$ 1.64	\$ (1.84)

Weighted-average common shares outstanding - basic	743.6	740.5	742.5
Weighted-average common shares outstanding - diluted	749.0	742.3	742.5

See Notes to the Consolidated Financial Statements.

Dow Inc. and Subsidiaries
Consolidated Statements of Comprehensive Income

(In millions) For the years ended Dec 31,	2021	2020	2019
Net income (loss)	\$ 6,405	\$ 1,294	\$ (1,272)
Other comprehensive income (loss), net of tax			
Unrealized gains (losses) on investments	(45)	40	115
Cumulative translation adjustments	(425)	205	(32)
Pension and other postretirement benefit plans	2,225	(778)	(899)
Derivative instruments	123	(76)	(338)
Total other comprehensive income (loss)	1,878	(609)	(1,154)
Comprehensive income (loss)	8,283	685	(2,426)
Comprehensive income attributable to noncontrolling interests, net of tax	94	69	99
Comprehensive income (loss) attributable to Dow Inc.	\$ 8,189	\$ 616	\$ (2,525)

See Notes to the Consolidated Financial Statements.

Dow Inc. and Subsidiaries
Consolidated Balance Sheets

(In millions, except share amounts) At Dec 31,	2021	2020
Assets		
Current Assets		
Cash and cash equivalents	\$ 2,988	\$ 5,104
Accounts and notes receivable:		
Trade (net of allowance for doubtful receivables - 2021: \$54; 2020: \$51)	6,841	5,090
Other	2,713	2,300
Inventories	7,372	5,701
Other current assets	934	889
Total current assets	20,848	19,084
Investments		
Investment in nonconsolidated affiliates	2,045	1,327
Other investments (investments carried at fair value - 2021: \$2,079; 2020: \$1,674)	3,193	2,775
Noncurrent receivables	478	465
Total investments	5,716	4,567
Property		
Property	57,604	56,325
Less: Accumulated depreciation	37,049	36,086
Net property	20,555	20,239
Other Assets		
Goodwill	8,764	8,908
Other intangible assets (net of accumulated amortization - 2021: \$4,725; 2020: \$4,428)	2,881	3,352
Operating lease right-of-use assets	1,412	1,856
Deferred income tax assets	1,358	2,215
Deferred charges and other assets	1,456	1,249
Total other assets	15,871	17,580
Total Assets	\$ 62,990	\$ 61,470
Liabilities and Equity		
Current Liabilities		
Notes payable	\$ 161	\$ 156
Long-term debt due within one year	231	460
Accounts payable:		
Trade	5,577	3,763
Other	2,839	2,126
Operating lease liabilities - current	314	416
Income taxes payable	623	397
Accrued and other current liabilities	3,481	3,790
Total current liabilities	13,226	11,108
Long-Term Debt	14,280	16,491
Other Noncurrent Liabilities		
Deferred income tax liabilities	506	405
Pension and other postretirement benefits - noncurrent	7,557	11,648
Asbestos-related liabilities - noncurrent	931	1,013
Operating lease liabilities - noncurrent	1,149	1,521
Other noncurrent obligations	6,602	6,279
Total other noncurrent liabilities	16,745	20,866
Stockholders' Equity		
Common stock (authorized 5,000,000,000 shares of \$0.01 par value each; issued 2021: 764,226,882 shares; 2020: 755,993,198 shares)	8	8
Additional paid-in capital	8,151	7,595
Retained earnings	20,623	16,361
Accumulated other comprehensive loss	(8,977)	(10,855)
Unearned ESOP shares	(15)	(49)
Treasury stock at cost (2021: 29,011,573 shares; 2020: 12,803,303 shares)	(1,625)	(625)
Dow Inc.'s stockholders' equity	18,165	12,435
Noncontrolling interests	574	570
Total equity	18,739	13,005
Total Liabilities and Equity	\$ 62,990	\$ 61,470

See Notes to the Consolidated Financial Statements.

Dow Inc. and Subsidiaries
Consolidated Statements of Cash Flows

(In millions) For the years ended Dec 31,	2021	2020	2019
Operating Activities			
Net income (loss)	\$ 6,405	\$ 1,294	\$ (1,272)
Less: Income from discontinued operations, net of tax	—	—	445
Income (loss) from continuing operations, net of tax	6,405	1,294	(1,717)
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	2,842	2,874	2,938
Provision (credit) for deferred income tax	278	258	(228)
Earnings of nonconsolidated affiliates less than (in excess of) dividends received	(651)	443	1,114
Net periodic pension benefit cost	39	266	144
Pension contributions	(1,219)	(299)	(261)
Net gain on sales of assets, businesses and investments	(105)	(802)	(81)
Restructuring, goodwill impairment and asset related charges - net	6	708	3,219
Other net loss	921	318	198
Changes in assets and liabilities, net of effects of acquired and divested companies:			
Accounts and notes receivable	(2,132)	171	1,253
Inventories	(1,768)	515	668
Accounts payable	2,458	(84)	(948)
Other assets and liabilities, net	(5)	590	(586)
Cash provided by operating activities - continuing operations	7,069	6,252	5,713
Cash provided by (used for) operating activities - discontinued operations	(60)	(26)	217
Cash provided by operating activities	7,009	6,226	5,930
Investing Activities			
Capital expenditures	(1,501)	(1,252)	(1,961)
Investment in gas field developments	(92)	(5)	(76)
Purchases of previously leased assets	(694)	(5)	(9)
Proceeds from sales of property and businesses, net of cash divested	68	929	84
Acquisitions of property and businesses, net of cash acquired	(129)	(130)	—
Investments in and loans to nonconsolidated affiliates	—	(333)	(638)
Distributions and loan repayments from nonconsolidated affiliates	51	7	89
Purchases of investments	(1,366)	(1,203)	(899)
Proceeds from sales and maturities of investments	759	1,122	1,252
Other investing activities, net	(10)	29	—
Cash used for investing activities - continuing operations	(2,914)	(841)	(2,158)
Cash used for investing activities - discontinued operations	—	—	(34)
Cash used for investing activities	(2,914)	(841)	(2,192)
Financing Activities			
Changes in short-term notes payable	(48)	(431)	307
Proceeds from issuance of short-term debt greater than three months	144	163	—
Payments on short-term debt greater than three months	(130)	(163)	—
Proceeds from issuance of long-term debt	109	4,672	2,287
Payments on long-term debt	(2,771)	(4,653)	(5,561)
Purchases of treasury stock	(1,000)	(125)	(500)
Proceeds from issuance of stock	320	108	93
Transaction financing, debt issuance and other costs	(537)	(175)	(119)
Employee taxes paid for share-based payment arrangements	(12)	(27)	(60)
Distributions to noncontrolling interests	(73)	(62)	(77)
Purchases of noncontrolling interests	—	—	(297)
Dividends paid to stockholders	(2,073)	(2,071)	(1,550)
Dividends paid to DowDuPont Inc.	—	—	(535)
Settlements and transfers related to separation from DowDuPont Inc.	—	—	1,935
Cash used for financing activities - continuing operations	(6,071)	(2,764)	(4,077)
Cash used for financing activities - discontinued operations	—	—	(18)
Cash used for financing activities	(6,071)	(2,764)	(4,095)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(99)	107	(27)
Summary			
Increase (decrease) in cash, cash equivalents and restricted cash	(2,075)	2,728	(384)
Cash, cash equivalents and restricted cash at beginning of year	5,108	2,380	2,764
Cash, cash equivalents and restricted cash at end of year	\$ 3,033	\$ 5,108	\$ 2,380
Less: Restricted cash and cash equivalents, included in "Other current assets"	45	4	13
Cash and cash equivalents at end of year	\$ 2,988	\$ 5,104	\$ 2,367

See Notes to the Consolidated Financial Statements.

Dow Inc. and Subsidiaries
Consolidated Statements of Equity

(In millions, except per share amounts) For the years ended Dec 31,	2021	2020	2019
Common Stock			
Balance at beginning of year	\$ 8	\$ 8	\$ —
Common stock issued	—	—	8
Balance at end of year	8	8	8
Additional Paid-in Capital			
Balance at beginning of year	7,595	7,325	7,042
Common stock issued / sold	320	108	57
Issuance of parent company stock - DowDuPont Inc.	—	—	28
Stock-based compensation and allocation of ESOP shares	236	162	235
Other	—	—	(37)
Balance at end of year	8,151	7,595	7,325
Retained Earnings			
Balance at beginning of year	16,361	17,045	35,460
Net income (loss) available for Dow Inc.'s common stockholders	6,311	1,225	(1,359)
Dividends to stockholders	(2,073)	(2,071)	(1,550)
Dividends to DowDuPont Inc.	—	—	(535)
Common control transaction	46	177	(14,806)
Adoption of accounting standards	—	—	(151)
Other	(22)	(15)	(14)
Balance at end of year	20,623	16,361	17,045
Accumulated Other Comprehensive Loss			
Balance at beginning of year	(10,855)	(10,246)	(9,885)
Other comprehensive income (loss)	1,878	(609)	(1,154)
Common control transaction	—	—	793
Balance at end of year	(8,977)	(10,855)	(10,246)
Unearned ESOP Shares			
Balance at beginning of year	(49)	(91)	(134)
Stock-based compensation and allocation of ESOP shares	34	42	45
ESOP shares acquired	—	—	(2)
Balance at end of year	(15)	(49)	(91)
Treasury Stock			
Balance at beginning of year	(625)	(500)	—
Treasury stock purchases	(1,000)	(125)	(500)
Balance at end of year	(1,625)	(625)	(500)
Dow Inc.'s stockholders' equity	18,165	12,435	13,541
Noncontrolling Interests	574	570	553
Total Equity	\$ 18,739	\$ 13,005	\$ 14,094
Dividends declared per share of common stock	\$ 2.80	\$ 2.80	\$ 2.10

See Notes to the Consolidated Financial Statements.

The Dow Chemical Company and Subsidiaries
Consolidated Statements of Income

(In millions) For the years ended Dec 31,	2021	2020	2019
Net sales	\$ 54,968	\$ 38,542	\$ 42,951
Cost of sales	44,187	33,343	36,657
Research and development expenses	857	768	765
Selling, general and administrative expenses	1,645	1,471	1,585
Amortization of intangibles	388	401	419
Restructuring, goodwill impairment and asset related charges - net	6	708	3,219
Integration and separation costs	—	239	1,039
Equity in earnings (losses) of nonconsolidated affiliates	975	(18)	(94)
Sundry income (expense) - net	(79)	1,274	573
Interest income	56	40	81
Interest expense and amortization of debt discount	731	827	952
Income (loss) from continuing operations before income taxes	8,106	2,081	(1,125)
Provision for income taxes on continuing operations	1,738	777	470
Income (loss) from continuing operations, net of tax	6,368	1,304	(1,595)
Income from discontinued operations, net of tax	—	—	445
Net income (loss)	6,368	1,304	(1,150)
Net income attributable to noncontrolling interests	94	69	87
Net income (loss) available for The Dow Chemical Company common stockholder	\$ 6,274	\$ 1,235	\$ (1,237)

See Notes to the Consolidated Financial Statements.

The Dow Chemical Company and Subsidiaries
Consolidated Statements of Comprehensive Income

(In millions) For the years ended Dec 31,	2021	2020	2019
Net income (loss)	\$ 6,368	\$ 1,304	\$ (1,150)
Other comprehensive income (loss), net of tax			
Unrealized gains (losses) on investments	(45)	40	115
Cumulative translation adjustments	(425)	205	(32)
Pension and other postretirement benefit plans	2,225	(778)	(899)
Derivative instruments	123	(76)	(338)
Total other comprehensive income (loss)	1,878	(609)	(1,154)
Comprehensive income (loss)	8,246	695	(2,304)
Comprehensive income attributable to noncontrolling interests, net of tax	94	69	99
Comprehensive income (loss) attributable to The Dow Chemical Company	\$ 8,152	\$ 626	\$ (2,403)

See Notes to the Consolidated Financial Statements.

The Dow Chemical Company and Subsidiaries
Consolidated Balance Sheets

(In millions, except share amounts) At Dec 31,	2021	2020
Assets		
Current Assets		
Cash and cash equivalents	\$ 2,988	\$ 5,104
Accounts and notes receivable:		
Trade (net of allowance for doubtful receivables - 2021: \$54; 2020: \$51)	6,841	5,090
Other	2,712	2,302
Inventories	7,372	5,701
Other current assets	924	801
Total current assets	20,837	18,998
Investments		
Investment in nonconsolidated affiliates	2,045	1,327
Other investments (investments carried at fair value - 2021: \$2,079; 2020: \$1,674)	3,193	2,775
Noncurrent receivables	452	426
Total investments	5,690	4,528
Property		
Property	57,604	56,325
Less: Accumulated depreciation	37,049	36,086
Net property	20,555	20,239
Other Assets		
Goodwill	8,764	8,908
Other intangible assets (net of accumulated amortization - 2021: \$4,725; 2020: \$4,428)	2,881	3,352
Operating lease right-of-use assets	1,412	1,856
Deferred income tax assets	1,358	2,215
Deferred charges and other assets	1,455	1,249
Total other assets	15,870	17,580
Total Assets	\$ 62,952	\$ 61,345
Liabilities and Equity		
Current Liabilities		
Notes payable	\$ 161	\$ 156
Long-term debt due within one year	231	460
Accounts payable:		
Trade	5,577	3,763
Other	2,841	2,126
Operating lease liabilities - current	314	416
Income taxes payable	623	397
Accrued and other current liabilities	3,299	3,256
Total current liabilities	13,046	10,574
Long-Term Debt	14,280	16,491
Other Noncurrent Liabilities		
Deferred income tax liabilities	506	405
Pension and other postretirement benefits - noncurrent	7,557	11,648
Asbestos-related liabilities - noncurrent	931	1,013
Operating lease liabilities - noncurrent	1,149	1,521
Other noncurrent obligations	6,454	6,124
Total other noncurrent liabilities	16,597	20,711
Stockholder's Equity		
Common stock (authorized and issued 100 shares of \$0.01 par value each)	—	—
Additional paid-in capital	8,159	7,603
Retained earnings	19,288	16,300
Accumulated other comprehensive loss	(8,977)	(10,855)
Unearned ESOP shares	(15)	(49)
The Dow Chemical Company's stockholder's equity	18,455	12,999
Noncontrolling interests	574	570
Total equity	19,029	13,569
Total Liabilities and Equity	\$ 62,952	\$ 61,345

See Notes to the Consolidated Financial Statements.

The Dow Chemical Company and Subsidiaries
Consolidated Statements of Cash Flows

(In millions) For the years ended Dec 31,	2021	2020	2019
Operating Activities			
Net income (loss)	\$ 6,368	\$ 1,304	\$ (1,150)
Less: Income from discontinued operations, net of tax	—	—	445
Income (loss) from continuing operations, net of tax	6,368	1,304	(1,595)
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	2,842	2,874	2,938
Provision (credit) for deferred income tax	278	258	(228)
Earnings of nonconsolidated affiliates less than (in excess of) dividends received	(651)	443	1,114
Net periodic pension benefit cost	39	266	144
Pension contributions	(1,219)	(299)	(261)
Net gain on sales of assets, businesses and investments	(105)	(802)	(81)
Restructuring, goodwill impairment and asset related charges - net	6	708	3,219
Other net loss	927	320	213
Changes in assets and liabilities, net of effects of acquired and divested companies:			
Accounts and notes receivable	(2,132)	171	1,253
Inventories	(1,768)	515	668
Accounts payable	2,458	(84)	(948)
Other assets and liabilities, net	157	589	(730)
Cash provided by operating activities - continuing operations	7,200	6,263	5,706
Cash provided by operating activities - discontinued operations	—	—	371
Cash provided by operating activities	7,200	6,263	6,077
Investing Activities			
Capital expenditures	(1,501)	(1,252)	(1,961)
Investment in gas field developments	(92)	(5)	(76)
Purchases of previously leased assets	(694)	(5)	(9)
Proceeds from sales of property and businesses, net of cash divested	68	929	84
Acquisitions of property and businesses, net of cash acquired	(129)	(130)	—
Investments in and loans to nonconsolidated affiliates	—	(333)	(638)
Distributions and loan repayments from nonconsolidated affiliates	51	7	89
Purchases of investments	(1,366)	(1,203)	(899)
Proceeds from sales and maturities of investments	759	1,122	1,252
Other investing activities, net	(10)	29	—
Cash used for investing activities - continuing operations	(2,914)	(841)	(2,158)
Cash used for investing activities - discontinued operations	—	—	(34)
Cash used for investing activities	(2,914)	(841)	(2,192)
Financing Activities			
Changes in short-term notes payable	(48)	(431)	307
Proceeds from issuance of short-term debt greater than three months	144	163	—
Payments on short-term debt greater than three months	(130)	(163)	—
Proceeds from issuance of long-term debt	109	4,672	2,287
Payments on long-term debt	(2,771)	(4,653)	(5,561)
Proceeds from issuance of stock	320	108	93
Transaction financing, debt issuance and other costs	(537)	(175)	(119)
Employee taxes paid for share-based payment arrangements	(12)	(27)	(60)
Distributions to noncontrolling interests	(73)	(62)	(77)
Purchases of noncontrolling interests	—	—	(297)
Dividends paid to DowDuPont Inc.	—	—	(535)
Dividends paid to Dow Inc.	(3,264)	(2,233)	(201)
Settlements and transfers related to separation from DowDuPont Inc.	—	—	(61)
Cash used for financing activities - continuing operations	(6,262)	(2,801)	(4,224)
Cash used for financing activities - discontinued operations	—	—	(18)
Cash used for financing activities	(6,262)	(2,801)	(4,242)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(99)	107	(27)
Summary			
Increase (decrease) in cash, cash equivalents and restricted cash	(2,075)	2,728	(384)
Cash, cash equivalents and restricted cash at beginning of year	5,108	2,380	2,764
Cash, cash equivalents and restricted cash at end of year	\$ 3,033	\$ 5,108	\$ 2,380
Less: Restricted cash and cash equivalents, included in "Other current assets"	45	4	13
Cash and cash equivalents at end of year	\$ 2,988	\$ 5,104	\$ 2,367

See Notes to the Consolidated Financial Statements.

The Dow Chemical Company and Subsidiaries
Consolidated Statements of Equity

(In millions, except per share amounts) For the years ended Dec 31,	2021	2020	2019
Common Stock			
Balance at beginning and end of year	\$ —	\$ —	\$ —
Additional Paid-in Capital			
Balance at beginning of year	7,603	7,333	7,042
Issuance of parent company stock - Dow Inc.	320	108	65
Issuance of parent company stock - DowDuPont Inc.	—	—	28
Stock-based compensation and allocation of ESOP shares	236	162	235
Other	—	—	(37)
Balance at end of year	8,159	7,603	7,333
Retained Earnings			
Balance at beginning of year	16,300	17,313	35,460
Net income (loss) available for The Dow Chemical Company's common stockholder	6,274	1,235	(1,237)
Dividends to Dow Inc.	(3,264)	(2,233)	(201)
Dividends to DowDuPont Inc.	—	—	(535)
Common control transaction	—	—	(16,009)
Adoption of accounting standards	—	—	(151)
Other	(22)	(15)	(14)
Balance at end of year	19,288	16,300	17,313
Accumulated Other Comprehensive Loss			
Balance at beginning of year	(10,855)	(10,246)	(9,885)
Other comprehensive income (loss)	1,878	(609)	(1,154)
Common control transaction	—	—	793
Balance at end of year	(8,977)	(10,855)	(10,246)
Unearned ESOP Shares			
Balance at beginning of year	(49)	(91)	(134)
Stock-based compensation and allocation of ESOP shares	34	42	45
ESOP shares acquired	—	—	(2)
Balance at end of year	(15)	(49)	(91)
The Dow Chemical Company's stockholder's equity	18,455	12,999	14,309
Noncontrolling Interests	574	570	553
Total Equity	\$ 19,029	\$ 13,569	\$ 14,862

See Notes to the Consolidated Financial Statements.

Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries
Notes to the Consolidated Financial Statements

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NOTE 1 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**Merger and Separation**

On April 1, 2019, DowDuPont Inc. ("DowDuPont" and effective June 3, 2019, n/k/a DuPont de Nemours, Inc. or "DuPont") completed the separation of its materials science business and Dow Inc. became the direct parent company of The Dow Chemical Company and its consolidated subsidiaries ("TDCC" and together with Dow Inc., "Dow" or the "Company"). The separation was contemplated by the merger of equals transaction effective August 31, 2017, under the Agreement and Plan of Merger, dated as of December 11, 2015, as amended on March 31, 2017 (the "Merger Agreement"). TDCC and E. I. du Pont de Nemours and Company and its consolidated subsidiaries ("Historical DuPont") each merged with subsidiaries of DowDuPont and, as a result, TDCC and Historical DuPont became subsidiaries of DowDuPont (the "Merger"). Subsequent to the Merger, TDCC and Historical DuPont engaged in a series of internal reorganization and realignment steps to realign their businesses into three subgroups: agriculture, materials science and specialty products. Dow Inc. was formed as a wholly owned subsidiary of DowDuPont to serve as the holding company for the materials science business. See Note 3 for additional information.

Principles of Consolidation and Basis of Presentation

The accompanying consolidated financial statements of Dow Inc. and TDCC were prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP") and include the assets, liabilities, revenues and expenses of all majority-owned subsidiaries over which Dow exercises control and, when applicable, entities for which Dow has a controlling financial interest or is the primary beneficiary. Intercompany transactions and balances are eliminated in consolidation. Investments in nonconsolidated affiliates (20-50 percent owned companies or less than 20 percent owned companies over which significant influence is exercised) are primarily accounted for using the equity method.

Effective April 1, 2019, Dow Inc. owns all of the outstanding common shares of TDCC. TDCC is deemed the predecessor to Dow Inc. and the historical results of TDCC are deemed the historical results of Dow Inc. for periods prior to and including March 31, 2019. As a result of the parent/subsidiary relationship between Dow Inc. and TDCC, and considering that the financial statements and disclosures of each company are substantially similar, the companies are filing a combined report for this Annual Report on Form 10-K. The information reflected in the report is equally applicable to both Dow Inc. and TDCC, except where otherwise noted.

As of the effective date and time of the distribution, DowDuPont no longer beneficially owned any equity interest in Dow and no longer consolidated Dow and its consolidated subsidiaries into its financial results. The consolidated financial results of Dow for the applicable periods presented reflect the distribution of TDCC's agricultural sciences business ("AgCo") and specialty products business ("SpecCo") as discontinued operations, as well as the receipt of Historical DuPont's ethylene and ethylene copolymers businesses (other than its ethylene acrylic elastomers business) ("ECP") as a common control transaction from the closing of the Merger on August 31, 2017 ("Merger Date"). See Note 3 for additional information.

The Company conducts its worldwide operations through six global businesses which are organized into the following operating segments: Packaging & Specialty Plastics, Industrial Intermediates & Infrastructure and Performance Materials & Coatings. Corporate contains the reconciliation between the totals for the operating segments and the Company's totals. See Note 26 for additional information.

From the Merger Date through the separation, transactions between DowDuPont, TDCC and Historical DuPont and their affiliates were treated as related party transactions. Transactions between TDCC and Historical DuPont primarily consisted of the sale and procurement of certain raw materials that were consumed in each company's manufacturing process. Transactions between TDCC and Dow Inc. are treated as related party transactions for TDCC. See Note 25 for additional information.

Throughout this Annual Report on Form 10-K, unless otherwise indicated, amounts and activity are presented on a continuing operations basis.

Except as otherwise indicated by the context, the term "Union Carbide" means Union Carbide Corporation and the term "Dow Silicones" means Dow Silicones Corporation, both wholly owned subsidiaries of the Company.

Certain reclassifications of prior period amounts have been made to conform with the current year presentation.

Use of Estimates in Financial Statement Preparation

The preparation of financial statements in accordance with U.S. GAAP requires the use of estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. The Company's consolidated financial statements include amounts that are based on management's best estimates and judgments. Actual results could differ from those estimates.

Significant Accounting Policies

Asbestos-Related Matters

Accruals for asbestos-related matters, including defense and processing costs, are recorded based on an analysis of claim and resolution activity, defense spending, and pending and future claims. These accruals are assessed at each balance sheet date to determine if the asbestos-related liability remains appropriate. Accruals for asbestos-related matters are included in the consolidated balance sheets in "Accrued and other current liabilities" and "Asbestos-related liabilities - noncurrent." See Note 16 for additional information.

Legal Costs

The Company expenses legal costs as incurred, with the exception of defense and processing costs associated with asbestos-related matters.

Foreign Currency Translation

The local currency has been primarily used as the functional currency throughout the world. Translation gains and losses of those operations that use local currency as the functional currency are included in the consolidated balance sheets in "Accumulated other comprehensive loss" ("AOCL"). For certain subsidiaries, the U.S. dollar is used as the functional currency. This occurs when the subsidiary operates in an economic environment where the products produced and sold are tied to U.S. dollar-denominated markets, or when the foreign subsidiary operates in a hyper-inflationary environment. Where the U.S. dollar is used as the functional currency, foreign currency translation gains and losses are reflected in income.

Environmental Matters

Accruals for environmental matters are recorded when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated based on current law and existing technologies. These accruals are adjusted periodically as assessment and remediation efforts progress or as additional technical or legal information becomes available. Accruals for environmental liabilities are included in the consolidated balance sheets in "Accrued and other current liabilities" and "Other noncurrent obligations" at undiscounted amounts. Accruals for related insurance or other third-party recoveries for environmental liabilities are recorded when it is probable that a recovery will be realized and are included in the consolidated balance sheets in "Accounts and notes receivable - Other" or "Noncurrent receivables."

Environmental costs are capitalized if the costs extend the life of the property, increase its capacity and/or mitigate or prevent contamination from future operations. Environmental costs are also capitalized in recognition of legal asset retirement obligations resulting from the acquisition, construction and/or normal operation of a long-lived asset. Costs related to environmental contamination treatment and cleanup are charged to expense. Estimated future incremental operations, maintenance and management costs directly related to remediation are accrued when such costs are probable and reasonably estimable.

Cash and Cash Equivalents

Cash and cash equivalents include time deposits and investments with maturities of three months or less at the time of purchase.

Financial Instruments

The Company calculates the fair value of financial instruments using quoted market prices when available. When quoted market prices are not available for financial instruments, the Company uses standard pricing models with market-based inputs that take into account the present value of estimated future cash flows.

The Company utilizes derivatives to manage exposures to foreign currency exchange rates, commodity prices and interest rate risk. The fair values of all derivatives are recognized as assets or liabilities at the balance sheet date. Changes in the fair values of these instruments are reported in income or AOCL, depending on the use of the derivative and whether the Company has elected hedge accounting treatment.

Gains and losses on derivatives that are designated and qualify as cash flow hedging instruments are recorded in AOCL until the underlying transactions are recognized in income. Gains and losses on derivative and non-derivative instruments used as hedges of the Company's net investment in foreign operations are recorded in AOCL as part of the cumulative translation adjustment.

Gains and losses on derivatives designated and qualifying as fair value hedging instruments, as well as the offsetting losses and gains on the hedged items, are reported in income in the same accounting period. Derivatives not designated as hedging instruments are marked-to-market at the end of each accounting period with the results included in income.

Inventories

Inventories are stated at the lower of cost or net realizable value. The method of determining cost for each subsidiary varies among last-in, first-out (“LIFO”); first-in, first-out (“FIFO”); and average cost, and is used consistently from year to year. At December 31, 2021, approximately 27 percent, 65 percent and 8 percent of the Company's inventories were accounted for under the LIFO, FIFO and average cost methods, respectively. At December 31, 2020, approximately 30 percent, 58 percent and 12 percent of the Company's inventories were accounted for under the LIFO, FIFO and average cost methods, respectively.

The Company routinely exchanges and swaps raw materials and finished goods with other companies to reduce delivery time, freight and other transportation costs. These transactions are treated as non-monetary exchanges and are valued at cost.

Property

Land, buildings and equipment are carried at cost less accumulated depreciation or amortization. Property under finance lease agreements is carried at the present value of lease payments over the lease term less accumulated amortization. Depreciation is based on the estimated service lives of depreciable assets and is calculated using the straight-line method. Fully depreciated assets are retained in property and accumulated depreciation accounts until they are removed from service. In the case of disposals, assets and related accumulated depreciation are removed from the accounts, and the net amounts, less proceeds from disposal, are included in income.

Impairment and Disposal of Long-Lived Assets

The Company evaluates long-lived assets (property, finite-lived intangible assets and right-of-use assets) for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. When undiscounted future cash flows are not expected to be sufficient to recover an asset's carrying amount, the asset is written down to its fair value based on bids received from third parties or a discounted cash flow analysis based on market participant assumptions.

Long-lived assets to be disposed of by sale, if material, are classified as held for sale and reported at the lower of carrying amount or fair value less cost to sell, and depreciation/amortization is ceased. Long-lived assets to be disposed of other than by sale are classified as held and used until they are disposed of and reported at the lower of carrying amount or fair value, and depreciation/amortization is recognized over the remaining useful life of the assets.

Goodwill and Other Intangible Assets

The Company records goodwill when the purchase price of a business combination exceeds the estimated fair value of net identified tangible and intangible assets acquired. Goodwill is tested for impairment at the reporting unit level annually in the fourth quarter, or more frequently when events or changes in circumstances indicate that the fair value of a reporting unit has more likely than not declined below its carrying value. When testing goodwill for impairment, the Company may first assess qualitative factors. If an initial qualitative assessment identifies that it is more likely than not that the fair value of a reporting unit is less than its carrying value, additional quantitative testing is performed. The Company may also elect to skip the qualitative testing and proceed directly to the quantitative testing. If the quantitative testing indicates that goodwill is impaired, an impairment charge is recognized based on the difference between the reporting unit's carrying value and its fair value. The Company primarily utilizes a discounted cash flow methodology to calculate the fair value of its reporting units.

Finite-lived intangible assets such as developed technology, customer-related, trademarks, tradenames and software, are amortized over their estimated useful lives, generally on a straight-line basis for periods ranging primarily from 3 to 20 years.

Asset Retirement Obligations

The Company records asset retirement obligations as incurred and reasonably estimable, including obligations for which the timing and/or method of settlement are conditional on a future event that may or may not be within the control of the Company. The fair values of obligations are recorded as liabilities on a discounted basis and are accreted over time for the change in present value. Costs associated with the liabilities are capitalized and amortized over the estimated remaining useful life of the asset, generally for periods of 10 years or less.

Investments

Investments in debt securities, primarily held by the Company's insurance operations, are classified as trading, available-for-sale or held-to-maturity. Investments classified as trading are reported at fair value with unrealized gains and losses related to mark-to-market adjustments included in income. Those classified as available-for-sale are reported at fair value with unrealized gains and losses recorded in AOCL. Those classified as held-to-maturity are recorded at amortized cost. The cost of investments sold is determined by FIFO or specific identification.

Investments in equity securities with a readily determinable fair value are reported at fair value with unrealized gains and losses related to mark-to-market adjustments included in income. Equity securities without a readily determinable fair value are accounted for at cost, adjusted for impairments and observable price changes in orderly transactions.

The Company routinely reviews its investments for declines in fair value below the cost basis. When events or changes in circumstances indicate the carrying value of an asset may not be recoverable, the security is written down, establishing a new cost basis.

Leases

The Company determines whether a contract contains a lease at contract inception. A contract contains a lease if there is an identified asset and the Company has the right to control the asset.

Operating lease right-of-use ("ROU") assets represent the Company's right to use an underlying asset for the lease term, and lease liabilities represent the Company's obligation to make lease payments arising from the lease. Operating lease ROU assets and lease liabilities are recognized at commencement date based on the present value of lease payments over the lease term. The Company uses the incremental borrowing rate in determining the present value of lease payments, unless the implicit rate is readily determinable. If lease terms include options to extend or terminate the lease, the ROU asset and lease liability are measured based on the reasonably certain decision. Leases with a term of 12 months or less at the commencement date are not recognized on the balance sheet and are expensed as incurred.

The Company has lease agreements with lease and non-lease components, which are accounted for as a single lease component for nearly all classes of leased assets for which the Company is the lessee. Additionally, for certain equipment leases, the portfolio approach is applied to account for the operating lease ROU assets and lease liabilities. In the consolidated statements of income, lease expense for operating lease payments is recognized on a straight-line basis over the lease term. For finance leases, interest expense is recognized on the lease liability and the ROU asset is amortized over the lease term.

Some leasing arrangements require variable payments that are dependent upon usage or output, or may vary for other reasons, such as insurance or tax payments. Variable lease payments are recognized as incurred and are not presented as part of the ROU asset or lease liability. See Note 17 for additional information.

Revenue

The Company recognizes revenue when its customer obtains control of promised goods or services in an amount that reflects the consideration which the Company expects to receive in exchange for those goods or services. To determine revenue recognition, the Company performs the following five steps: (1) identify the contract(s) with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract and (5) recognize revenue when (or as) the entity satisfies a performance obligation. See Note 4 for additional information.

Revenue related to the Company's insurance operations includes third-party insurance premiums, which are earned over the terms of the related insurance policies and reinsurance contracts.

Severance Costs

The Company routinely reviews its operations around the world in an effort to ensure competitiveness across its businesses and geographic regions. When the reviews result in a workforce reduction related to the shutdown of facilities or other optimization activities, severance benefits are provided to employees primarily under the Company's ongoing benefit arrangements. These severance costs are accrued once management commits to a plan of termination and it becomes probable that employees will be entitled to benefits at amounts that can be reasonably estimated.

Integration and Separation Costs

The Company classifies expenses related to the Merger and separation as "Integration and separation costs" in the consolidated statements of income. Merger and separation related costs include: post-Merger integration expenses, costs incurred for the separation of AgCo and SpecCo and costs related to the integration of ECP. Integration and separation costs primarily consist of financial adviser, information technology, legal, accounting, consulting and other professional advisory fees associated with preparation and execution of these activities. Integration and separation costs related to the Merger and separation were completed as of December 31, 2020.

Income Taxes

The Company accounts for income taxes using the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the future tax consequences of temporary differences between the carrying amounts and tax bases of assets and liabilities using enacted tax rates. The effect of a change in tax rates on deferred tax assets or liabilities is recognized in income in the period that includes the enactment date. The Company uses the portfolio approach for releasing income tax effects from AOCL.

The Company recognizes the financial statement effects of an uncertain income tax position when it is more likely than not, based on the technical merits, that the position will be sustained upon examination. The Company accrues for other tax contingencies when it is probable that a liability to a taxing authority has been incurred and the amount of the contingency can be reasonably estimated. The current portion of uncertain income tax positions is included in "Income taxes payable" and the long-term portion is included in "Other noncurrent obligations" in the consolidated balance sheets.

Provision is made for taxes on undistributed earnings of foreign subsidiaries and related companies to the extent that such earnings are not deemed to be permanently invested.

Earnings per Common Share

The calculation of earnings per common share is based on the weighted-average number of the Company's common shares outstanding for the applicable period. The calculation of diluted earnings per common share reflects the effect of all potential common shares that were outstanding during the respective periods, unless the effect of doing so is antidilutive.

Adoption of Accounting Standards

Effective January 1, 2019, the Company adopted Accounting Standards Update ("ASU") 2016-02, "Leases (Topic 842)," and the associated ASUs (collectively, "Topic 842") and added the accounting policy on leases discussed in the section above. Adoption of the new standard resulted in the recording of operating lease ROU assets and lease liabilities of \$2.3 billion at January 1, 2019. The net impact to "Retained earnings" was an increase of \$32 million and was primarily a result of the recognition of a deferred gain associated with a prior sale-leaseback transaction. The impact is reflected in the "Adoption of accounting standards" line in the consolidated statements of equity of both Dow Inc. and TDCC. See Note 17 for additional information.

In addition, the consolidated financial statements reflect the impact of the adoption of ASU 2014-09, "Revenue from Contracts with Customers (Topic 606)," and the associated ASUs (collectively, "Topic 606") at January 1, 2019 by certain nonconsolidated affiliates of the Company, which were subsequently distributed as part of the separation from DowDuPont. The net impact was reflected in assets and liabilities of discontinued operations with a corresponding reduction to "Retained earnings" of \$183 million in the consolidated balance sheets at January 1, 2019. The impact is reflected in the "Adoption of accounting standards" line in the consolidated statements of equity of both Dow Inc. and TDCC.

TDCC Dividends

Effective with the Merger, TDCC no longer had publicly traded common stock. TDCC's common shares were owned solely by its parent company, DowDuPont, prior to separation, and TDCC's Board of Directors ("Board") determined whether or not there would be a dividend distribution to DowDuPont. Effective with the separation from DowDuPont, TDCC became a wholly owned subsidiary of Dow Inc. and TDCC's Board determines whether or not there will be a dividend distribution to Dow Inc. See Notes 18 and 25 for additional information.

NOTE 2 – RECENT ACCOUNTING GUIDANCE

Recently Adopted Accounting Guidance

In the first quarter of 2021, the Company adopted Accounting Standards Update 2019-12, "Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes." The amendments simplify the accounting for income taxes by removing certain exceptions to the general principles of Topic 740, "Income Taxes" and improve consistent application by clarifying and amending existing guidance. The adoption of this guidance did not have a material impact on the consolidated financial statements.

NOTE 3 – SEPARATION FROM DOWDUPONT

Effective August 31, 2017, TDCC and Historical DuPont completed the merger of equals transaction contemplated by the Merger Agreement, by and among TDCC, Historical DuPont, DowDuPont, Diamond Merger Sub, Inc. and Orion Merger Sub, Inc. Pursuant to the Merger Agreement, (i) Diamond Merger Sub, Inc. was merged with and into TDCC, with TDCC surviving the merger as a subsidiary of DowDuPont (the "Diamond Merger") and (ii) Orion Merger Sub, Inc. was merged with and into Historical DuPont, with Historical DuPont surviving the merger as a subsidiary of DowDuPont (the "Orion Merger" and, together with the Diamond Merger, the "Mergers"). Following the consummation of the Mergers, each of TDCC and Historical DuPont became subsidiaries of DowDuPont. Subsequent to the Merger, TDCC and Historical DuPont engaged in a series of internal reorganization and realignment steps to realign their businesses into three subgroups: agriculture, materials science and specialty products. Dow Inc. was formed as a wholly owned subsidiary of DowDuPont to serve as the holding company for the materials science business.

On April 1, 2019, DowDuPont completed the previously announced separation of its materials science business. The separation was effected by way of a pro rata distribution of all of the then-issued and outstanding shares of Dow Inc. common stock to DowDuPont stockholders of record as of the close of business, Eastern Time, on March 21, 2019 (the "Record Date"). The shareholders of record of DowDuPont received one share of Dow Inc. common stock, par value \$0.01 per share, for every three shares of DowDuPont common stock, par value \$0.01 per share, held as of the Record Date. No fractional shares of Dow Inc. common stock were issued. Instead, cash in lieu of any fractional shares was paid to DowDuPont registered shareholders. The number of shares of Dow Inc. common stock issued on April 1, 2019 was 748.8 million shares. Dow Inc. is now an independent, publicly traded company and Dow Inc. common stock is listed on the NYSE under the symbol "DOW." Dow Inc. common stock began regular-way trading on April 2, 2019, the first day following the distribution.

Effective April 1, 2019, TDCC became a wholly owned subsidiary of Dow Inc. As of the effective date and time of the distribution, DowDuPont did not beneficially own any equity interest in Dow and no longer consolidated Dow and its consolidated subsidiaries into its financial results. Beginning in the second quarter of 2019, Dow's consolidated financial results reflect the results of Dow Inc. and its consolidated subsidiaries - that is, TDCC after giving effect to the distribution of AgCo and SpecCo and the receipt of ECP. The consolidated financial results of Dow for periods prior to April 1, 2019, reflect the distribution of AgCo and SpecCo as discontinued operations for each period presented as well as reflect the receipt of ECP as a common control transaction from the closing of the Merger on August 31, 2017.

On April 1, 2019, Dow Inc. received a cash contribution of \$2,024 million from DowDuPont as part of the internal reorganization and business realignment steps between Dow Inc., TDCC and DowDuPont. Dow Inc. recognized a reduction to "Retained earnings" of \$14,806 million in 2019 as a result of the cash contribution, the distribution of AgCo and SpecCo, and other separation related adjustments. TDCC recognized a reduction to "Retained earnings" of \$16,009 million in 2019 as a result of the distribution of AgCo and SpecCo.

Receipt of ECP

As the receipt of ECP was accounted for as a transfer between entities under common control, the consolidated financial statements have been retrospectively adjusted to reflect the receipt of ECP from the closing of the Merger on August 31, 2017. All intercompany transactions have been eliminated in consolidation.

Distribution of AgCo and SpecCo

Upon distribution, the Company retrospectively adjusted the previously issued consolidated financial statements and presented AgCo and SpecCo as discontinued operations based on the guidance in ASC 205-20 "Discontinued Operations" ("ASC 205-20"). The results of operations of AgCo and SpecCo are presented as discontinued operations in the consolidated statements of income and are summarized in the following table:

Results of Operations of AgCo and SpecCo	
In millions	2019 ¹
Net sales	\$ 2,953
Cost of sales	1,804
Research and development expenses	175
Selling, general and administrative expenses	262
Amortization of intangibles	61
Restructuring and asset related charges - net	78
Equity in earnings of nonconsolidated affiliates	28
Sundry income (expense) - net	(18)
Interest income	3
Interest expense and amortization of debt discount	7
Income from discontinued operations before income taxes	\$ 579
Provision for income taxes	134
Income from discontinued operations, net of tax	\$ 445

1. Results through March 31, 2019.

Agreements Related to the Separation and Distribution

In connection with the separation, Dow Inc. entered into certain agreements with DuPont and/or Corteva, Inc. ("Corteva"), including the following: Separation and Distribution Agreement, Tax Matters Agreement and Employee Matters Agreement (collectively, the "Agreements"). In addition to establishing the terms of the separation, the Agreements provide a framework for Dow's interaction with DuPont and Corteva after the separation and also provide for the allocation among Dow, DuPont and Corteva of assets, liabilities and obligations attributable to periods prior to, at and after the completion of the separation. The Agreements also contain certain indemnity and/or cross-indemnity provisions that are intended to set forth each party's respective rights, responsibilities and obligations for matters subject to indemnification. Except in certain instances, the parties' indemnification obligations are uncapped. Certain indemnification obligations will be subject to reduction by insurance proceeds or other third-party proceeds of the indemnified party that reduces the amount of the loss. In addition, indemnifiable losses will be subject to, in certain cases, "de minimis" threshold amounts and, in certain cases, deductible amounts.

The impacts of indemnifications and other post-separation matters relating to the Agreements are primarily reflected in the consolidated financial statements of Dow Inc. In 2019, the Company recorded pretax charges related to the Agreements of \$69 million in "Sundry income (expense) - net" and \$24 million in "Integration and separation costs" in the consolidated statements of income of Dow Inc., related to Corporate.

At December 31, 2021, the Company had no assets (\$77 million at December 31, 2020) included in "Other current assets" and \$20 million (\$33 million at December 31, 2020) included in "Noncurrent receivables" and liabilities of \$148 million (\$412 million at December 31, 2020) included in "Accrued and other current liabilities" and \$39 million (\$46 million at December 31, 2020) included in "Other noncurrent obligations" in the consolidated balance sheets of Dow Inc. Any adjustments to these assets and liabilities in subsequent periods will be recorded in Dow Inc.'s results of operations.

In addition, the Company deferred approximately \$400 million of the cash distribution received from DowDuPont at separation and recorded an associated liability with an offset to "Retained earnings" in the consolidated balance sheets of Dow Inc. At December 31, 2021, \$15 million (\$103 million at December 31, 2020) of this liability was recorded in "Accrued and other current liabilities" and \$96 million (\$96 million at December 31, 2020) was recorded in "Other noncurrent obligations" in the consolidated balance sheets of Dow Inc. In the fourth quarter of 2021, due to changes in certain underlying exposures, Dow Inc. reversed \$46 million of the liability. Based on notices received in the fourth quarter of 2020, Dow Inc. reversed \$177 million of the liability. The impact of the reversals are reflected in the "Common control transaction" line in the consolidated statements of equity of Dow Inc. The final resolution of the remaining liability is uncertain and any subsequent adjustments to the carrying value of this liability will be reflected in equity of Dow Inc.

In 2021, Dow Inc. made net cash payments of \$60 million (\$18 million in 2020 and \$215 million in 2019) related to the Agreements, recorded in "Cash flows from operating activities - discontinued operations" in the Dow Inc. consolidated statements of cash flows. The Company also received \$144 million in 2021 (insignificant in 2020 and \$98 million in 2019) related to the Agreements, recorded in "Other assets and liabilities, net" within "Cash flows from operating activities - continuing operations" in the Dow Inc. consolidated statements of cash flows.

Continuing Involvement

The Company has certain product and service agreements with DuPont and Corteva that were considered intercompany transactions prior to the separation, but are trade transactions subsequent to the separation. These transactions have been retrospectively reclassified as trade transactions in the consolidated financial statements. Based on the Company's assessment of the specific factors identified in ASC Topic 205, "Presentation of Financial Statements," the Company concluded that these agreements do not constitute significant continuing involvement in AgCo or SpecCo.

Integration and Separation Costs

Integration and separation costs, which reflect costs related to post-Merger integration and business separation activities, were \$239 million in 2020 and \$1,063 million and \$1,039 million for Dow Inc. and TDCC, respectively, in 2019. Integration and separation costs related to post-Merger integration and business separation activities were completed as of December 31, 2020.

NOTE 4 – REVENUE

The majority of the Company's revenue is derived from product sales. In 2021, 99 percent of the Company's revenue related to product sales (99 percent in 2020 and 98 percent in 2019). The remaining sales were primarily related to the Company's insurance operations and licensing of patents and technologies.

Product Sales

Product sales consist of sales of the Company's products to manufacturers and distributors. The Company considers order confirmations or purchase orders, which in some cases are governed by master supply agreements, to be contracts with a customer. Product sale contracts are generally short-term contracts where the time between order confirmation and satisfaction of all performance obligations is less than one year. However, the Company has some long-term contracts which can span multiple years.

Revenues from product sales are recognized when the customer obtains control of the product, which occurs at a point in time, usually upon shipment, with payment terms typically in the range of 30 to 60 days after invoicing, depending on business and geographic region. When the Company performs shipping and handling activities after the transfer of control to the customer (e.g., when control transfers prior to shipment), these are considered fulfillment activities, and accordingly, the costs are accrued when the related revenue is recognized. Taxes collected from customers relating to product sales and remitted to governmental authorities are excluded from revenues. The Company elected to use the practical expedient to expense cash and non-cash sales incentives, as the amortization period for the costs to obtain the contract would have been one year or less.

Certain long-term contracts include a series of distinct goods that are delivered continuously to the customer through a pipeline (e.g., feedstocks). For these types of product sales, the Company invoices the customer in an amount that directly corresponds with the value to the customer of the Company's performance to date. As a result, the Company recognizes revenue based on the amount billable to the customer in accordance with the right to invoice practical expedient.

The transaction price includes estimates for reductions in revenue from customer rebates and right of returns on product sales. These amounts are estimated based upon the most likely amount of consideration to which the customer will be entitled. All estimates are based on historical experience, anticipated performance and the Company's best judgment at the time to the extent it is probable that a significant reversal of revenue recognized will not occur. All estimates for variable consideration are reassessed periodically. The Company elected the practical expedient to not adjust the amount of consideration for the effects of a significant financing component for all instances in which the period between payment and transfer of the goods will be one year or less.

For contracts with multiple performance obligations, the Company allocates the transaction price to each performance obligation based on the relative standalone selling price. The standalone selling price is the observable price which depicts the price as if sold to a similar customer in similar circumstances.

Patents, Trademarks and Licenses

The Company enters into licensing arrangements in which it licenses certain rights of its patents and technology to customers. Revenue from the majority of the Company's licenses for patents and technology is derived from sales-based royalties. The Company estimates the amount of sales-based royalties it expects to be entitled to based on historical sales to the customer. For the remaining revenue from licensing arrangements, payments are typically received from the Company's licensees based on billing schedules established in each contract. Revenue is recognized when the performance obligation is satisfied.

Remaining Performance Obligations

Remaining performance obligations represent the transaction price allocated to unsatisfied or partially unsatisfied performance obligations. At December 31, 2021, the Company had unfulfilled performance obligations of \$829 million (\$977 million at December 31, 2020) related to the licensing of technology and expects revenue to be recognized for the remaining performance obligations over the next six years.

The remaining performance obligations are for product sales that have expected durations of one year or less, product sales of materials delivered through a pipeline for which the Company has elected the right to invoice practical expedient, or variable consideration attributable to royalties for licenses of patents and technology. The Company has received advance payments from customers related to long-term supply agreements that are deferred and recognized over the life of the contract, with remaining contract terms that range up to 19 years. The Company will have rights to future consideration for revenue recognized when product is delivered to the customer. These payments are included in "Accrued and other current liabilities" and "Other noncurrent obligations" in the consolidated balance sheets.

Disaggregation of Revenue

Dow disaggregates its revenue from contracts with customers by operating segment and business, as the Company believes it best depicts the nature, amount, timing and uncertainty of its revenue and cash flows. See details in the tables below:

Net Trade Sales by Segment and Business			
In millions	2021	2020	2019
Hydrocarbons & Energy	\$ 8,149	\$ 4,271	\$ 5,357
Packaging and Specialty Plastics	19,979	14,030	14,888
Packaging & Specialty Plastics	\$ 28,128	\$ 18,301	\$ 20,245
Industrial Solutions	\$ 5,139	\$ 3,929	\$ 4,310
Polyurethanes & Construction Chemicals	11,700	8,080	9,117
Others	12	12	13
Industrial Intermediates & Infrastructure	\$ 16,851	\$ 12,021	\$ 13,440
Coatings & Performance Monomers	\$ 4,050	\$ 3,258	\$ 3,517
Consumer Solutions	5,622	4,693	5,406
Performance Materials & Coatings	\$ 9,672	\$ 7,951	\$ 8,923
Corporate	\$ 317	\$ 269	\$ 343
Total	\$ 54,968	\$ 38,542	\$ 42,951

Net Trade Sales by Geographic Region			
In millions	2021	2020	2019
U.S. & Canada	\$ 19,613	\$ 13,582	\$ 15,549
EMEA ¹	19,746	12,969	14,612
Asia Pacific	10,043	8,165	8,676
Latin America	5,566	3,826	4,114
Total	\$ 54,968	\$ 38,542	\$ 42,951

1. Europe, Middle East, Africa and India.

Contract Assets and Liabilities

The Company receives payments from customers based upon contractual billing schedules. Accounts receivable are recorded when the right to consideration becomes unconditional. Contract assets include amounts related to the Company's contractual right to consideration for completed performance obligations not yet invoiced. Contract liabilities include payments received in advance of performance under the contract and are recognized in revenue when the performance obligations are met. "Contract liabilities - current" primarily reflects deferred revenue from prepayments from customers for product to be delivered in 12 months or less and royalty payments that are deferred and will be recognized in 12 months or less. "Contract liabilities - noncurrent" includes advance payments that the Company has received from customers related to long-term supply agreements and royalty payments that are deferred and recognized over the life of the contract.

Revenue recognized in 2021 from amounts included in contract liabilities at the beginning of the period was approximately \$295 million (approximately \$145 million in 2020 and 2019). In 2021, the amount of contract assets reclassified to receivables as a result of the right to the transaction consideration becoming unconditional was approximately \$35 million (approximately \$25 million in 2020). The Company did not recognize any asset impairment charges related to contract assets in 2021, 2020 or 2019.

The following table summarizes the contract assets and liabilities at December 31, 2021 and 2020:

Contract Assets and Liabilities at Dec 31			
In millions	<i>Balance Sheet Classification</i>	<i>2021</i>	<i>2020</i>
Accounts and notes receivable - trade	Accounts and notes receivable - Trade	\$ 6,841	\$ 5,090
Contract assets - current	Other current assets	\$ 34	\$ 58
Contract assets - noncurrent	Deferred charges and other assets	\$ 26	\$ 11
Contract liabilities - current ¹	Accrued and other current liabilities	\$ 209	\$ 349
Contract liabilities - noncurrent	Other noncurrent obligations	\$ 1,925	\$ 1,915

1. The decrease from December 31, 2020 to December 31, 2021 was due to recognition of deferred royalty payments.

NOTE 5 – DIVESTITURES

Divestiture of Rail Infrastructure Operations and Assets

On September 30, 2020, TDCC sold its rail infrastructure operations and assets, including existing agreements to provide rail services to unrelated third parties, at six sites in the U.S. & Canada to an affiliate of Watco Companies, L.L.C. for cash proceeds of \$303 million, net of costs to sell and other adjustments and subject to customary post-closing adjustments. These assets are located at TDCC's sites in Plaquemine and St. Charles, Louisiana; Freeport and Seadrift, Texas; and Fort Saskatchewan and Prentiss, Alberta, Canada. Divested operations included property with a net book value of \$68 million and goodwill of \$2 million (\$16 million related to Packaging & Specialty Plastics and \$54 million related to Corporate). TDCC retained ownership of the sites and underlying real property where the divested operations are located. TDCC and the buyer entered into mutual long-term service agreements designed to ensure the continuation of rail services for TDCC's existing operations at each site. The rail-service agreements include variable fees that have an initial term of 25 years. TDCC recognized a pretax gain of \$233 million on the sale (\$48 million related to Packaging & Specialty Plastics and \$185 million related to Corporate), included in "Sundry income (expense) - net" in the consolidated statements of income.

The Company evaluated the divestiture of the rail infrastructure operations and assets and determined it did not represent a strategic shift that had a major effect on the Company's operations and financial results and did not qualify as an individually significant component of the Company. As a result, the divestiture is not reported as discontinued operations.

Divestiture of Marine and Terminal Operations and Assets

On December 1, 2020, TDCC sold certain U.S. Gulf Coast marine and terminal operations and assets, including existing agreements to provide marine and terminal services to unrelated third parties, at three U.S. sites to an affiliate of Royal Vopak for cash proceeds of \$600 million, net of costs to sell and other adjustments and subject to customary post-closing adjustments. These assets are located at TDCC's sites in Plaquemine and St. Charles, Louisiana, and Freeport, Texas. Divested operations included property with a net book value of \$93 million and goodwill of \$8 million (\$7 million related to Packaging & Specialty Plastics, \$17 million related to Industrial Intermediates & Infrastructure and \$77 million related to Corporate). TDCC retained ownership of the sites and the underlying real property where the divested operations are located. TDCC and the buyer entered into mutual long-term service agreements designed to ensure the continuation of marine and terminal services for TDCC's existing operations at each site. The marine and terminal service agreements include fixed and variable fees that have initial terms of up to 25 years. In the fourth quarter of 2020, TDCC recognized a pretax gain of \$499 million on the sale (\$17 million related to Packaging & Specialty Plastics, \$61 million related to Industrial Intermediates & Infrastructure and \$421 million related to Corporate), included in "Sundry income (expense) - net" in the consolidated statements of income.

The Company evaluated the divestiture of the marine and terminal operations and assets and determined it did not represent a strategic shift that had a major effect on the Company's operations and financial results and did not qualify as an individually significant component of the Company. As a result, the divestiture is not reported as discontinued operations.

NOTE 6 – RESTRUCTURING, GOODWILL IMPAIRMENT AND ASSET RELATED CHARGES - NET

The "Restructuring, goodwill impairment and asset related charges - net" line in the consolidated statements of income is used to record charges for restructuring programs, goodwill impairments, and other asset related charges, which includes other asset impairments.

Restructuring Programs

2020 Restructuring Program

On September 29, 2020, the Board of Dow Inc. approved restructuring actions to achieve the Company's structural cost improvement initiatives in response to the continued economic impact from the coronavirus disease 2019 ("COVID-19") pandemic. The restructuring program was designed to reduce structural costs and enable the Company to further enhance competitiveness while the COVID-19 economic recovery gained traction. This program included a global workforce cost reduction of approximately 6 percent and actions to rationalize the Company's manufacturing assets, which included asset write-down and write-off charges, related contract termination fees and environmental remediation costs ("2020 Restructuring Program"). Severance benefits are provided to employees primarily under Dow's ongoing benefit arrangements and are accrued against the Corporate segment once management commits to a plan of termination. The actions related to the 2020 Restructuring Program were substantially complete by the end of 2021, except for certain cash payments expected to be made in 2022.

In the third quarter of 2020, the Company recorded pretax restructuring charges of \$575 million, consisting of severance and related benefit costs of \$297 million, asset write-downs and write-offs of \$197 million and costs associated with exit and disposal activities of \$81 million. In the fourth quarter of 2020, the Company recorded net favorable pretax restructuring credits of \$1 million related to asset write-downs and write-offs and \$1 million related to costs associated with exit and disposal activities (related to Performance Materials & Coatings and Corporate). The adjustment to costs associated with exit and disposal activities included curtailment costs associated with a defined benefit pension plan. See Note 20 for additional information. In 2021, the Company recorded pretax restructuring charges of \$12 million for asset write-downs and write-offs and \$10 million for costs associated with exit and disposal activities. In addition, the Company reduced pretax restructuring charges by \$10 million for severance and related benefit costs.

The following table summarizes the activities related to the 2020 Restructuring Program:

2020 Restructuring Program	<i>Severance and Related Benefit Costs</i>	<i>Asset Write-downs and Write-offs</i>	<i>Costs Associated with Exit and Disposal Activities</i>	<i>Total</i>
In millions				
Packaging & Specialty Plastics	\$ —	\$ 11	\$ —	\$ 11
Industrial Intermediates & Infrastructure	—	22	—	22
Performance Materials & Coatings	—	116	61	177
Corporate	297	47	19	363
Total restructuring charges	\$ 297	\$ 196	\$ 80	\$ 573
Charges against the reserve	—	(196)	(5)	(201)
Cash payments	(8)	—	—	(8)
Reserve balance at Dec 31, 2020	\$ 289	\$ —	\$ 75	\$ 364
Packaging & Specialty Plastics	\$ —	\$ —	\$ 8	\$ 8
Industrial Intermediates & Infrastructure	—	1	—	1
Performance Materials & Coatings	—	8	2	10
Corporate	(10)	3	—	(7)
Total restructuring charges	\$ (10)	\$ 12	\$ 10	\$ 12
Charges against the reserve	—	(12)	—	(12)
Cash payments	(175)	—	(21)	(196)
Reserve balance at Dec 31, 2021	\$ 104	\$ —	\$ 64	\$ 168

At December 31, 2021, \$112 million (\$227 million at December 31, 2020) of the reserve balance was included in "Accrued and other current liabilities" and \$56 million (\$137 million at December 31, 2020) was included in "Other noncurrent obligations" in the consolidated balance sheets.

The Company recorded pretax restructuring charges of \$585 million inception-to-date under the 2020 Restructuring Program, consisting of severance and related benefit costs of \$287 million, asset write-downs and write-offs of \$208 million and costs associated with exit and disposal activities of \$90 million.

Asset Write-downs and Write-offs

The 2020 Restructuring Program included charges related to the write-down and write-off of assets totaling \$196 million in 2020. Details regarding the asset write-downs and write-offs are as follows:

- Packaging & Specialty Plastics recorded a charge of \$11 million to rationalize its production capacity by shutting down a small-scale production unit.
- Industrial Intermediates & Infrastructure recorded a charge of \$22 million to rationalize its asset footprint by shutting down certain amines and solvents facilities in the United States and Europe as well as select, small-scale downstream polyurethanes manufacturing facilities.
- Performance Materials & Coatings recorded a charge of \$116 million to shut down manufacturing assets, primarily related to small-scale coatings reactors, and will also rationalize its upstream asset footprint in Europe and the U.S. & Canada by adjusting the supply of siloxane and silicon metal to balance to regional needs.
- Corporate recorded a charge of \$47 million related to the write-down of leased, non-manufacturing facilities and the write-down of miscellaneous assets.

The 2020 Restructuring Program included charges related to the write-down and write-off of assets totaling \$12 million in 2021, which included additional write-down and write-off of assets related to the actions listed above, impacting Industrial Intermediates & Infrastructure (\$1 million) and Performance Materials & Coatings (\$8 million), and the write-down of an additional non-manufacturing facility impacting Corporate (\$3 million).

Shut down related activities for impacted facilities were substantially complete by the end of 2021.

Costs Associated with Exit and Disposal Activities

The 2020 Restructuring Program included charges of \$80 million for costs associated with exit and disposal activities in 2020, which included \$19 million for contract termination fees related to the asset actions listed above, impacting Performance Materials & Coatings (\$9 million) and Corporate (\$10 million), as well as \$56 million for environmental remediation, impacting Performance Materials & Coatings (\$52 million) and Corporate (\$4 million) and \$5 million related to curtailment costs associated with a defined benefit pension plan, impacting Corporate.

The 2020 Restructuring Program included charges of \$10 million for costs associated with exit and disposal activities in 2021, which included contract termination fees and environmental remediation, impacting Packaging & Specialty Plastics (\$8 million) and Performance Materials & Coatings (\$2 million).

DowDuPont Cost Synergy Program

In September and November 2017, DowDuPont approved post-Merger restructuring actions under the DowDuPont Cost Synergy Program (the "Synergy Program") which was designed to integrate and optimize the organization following the Merger and in preparation for the business separations. The Company expected (prior to the impact of any discontinued operations) to record total pretax restructuring charges of approximately \$1.3 billion, which included initial estimates of approximately \$525 million to \$575 million of severance and related benefit costs, \$400 million to \$440 million of asset write-downs and write-offs, and \$290 million to \$310 million of costs associated with exit and disposal activities. The restructuring charges below reflect charges from continuing operations.

The Company recorded pretax restructuring charges of \$292 million in 2019, consisting of severance and related benefit costs of \$123 million, assets write-downs and write-offs of \$143 million and costs associated with exit and disposal activities of \$26 million.

In 2020, the Company recorded pretax restructuring charges of \$86 million and reduced pretax restructuring charges by \$6 million in 2021, both for severance and related benefit costs. Cash expenditures related to the Synergy Program were substantially complete at December 31, 2020.

At December 31, 2021, \$4 million was included in "Accrued and other current liabilities" (\$21 million at December 31, 2020) and \$10 million (\$13 million at December 31, 2020) was included in "Other noncurrent obligations" in the consolidated balance sheets.

The Company recorded pretax restructuring charges of \$955 million inception-to-date under the Synergy Program on a continuing operations basis, consisting of severance and related benefit costs of \$647 million, asset write-downs and write-offs of \$263 million and costs associated with exit and disposal activities of \$45 million.

Asset Write-downs and Write-offs

The restructuring charges related to the write-down and write-off of assets in 2019 under the Synergy Program were as follows:

- The Company recorded a charge of \$143 million for other miscellaneous asset write-downs and write-offs, including the shutdown of several small manufacturing facilities and the write-off of non-manufacturing assets and certain corporate facilities. The charge related to Industrial Intermediates & Infrastructure (\$2 million), Performance Materials & Coatings (\$28 million) and Corporate (\$113 million). These manufacturing facilities were substantially shut down by the end of 2020.

There were no restructuring charges related to the write-down and write-off of assets in 2020 and 2021 under the Synergy Program.

Costs Associated with Exit and Disposal Activities

The restructuring charges for costs associated with exit and disposal activities, including contract cancellation penalties and environmental remediation liabilities, totaled \$26 million in 2019 and zero in 2020 and 2021.

The Company expects to incur additional costs in the future related to its restructuring activities. Future costs are expected to include demolition costs related to closed facilities and restructuring implementation costs. These costs will be recognized as incurred. The Company also expects to incur additional employee-related costs, including involuntary termination benefits, related to its other optimization activities. These costs cannot be reasonably estimated at this time.

2019 Goodwill Impairment

Upon completion of the goodwill impairment testing in the fourth quarter of 2019, the Company determined the fair value of the Coatings & Performance Monomers reporting unit was lower than its carrying amount. As a result, the Company recorded an impairment charge of \$1,039 million in the fourth quarter of 2019, related to Performance Materials & Coatings. See Note 13 for additional information.

Asset Related Charges

2020 Charges

In 2020, the Company recognized pretax impairment charges of \$49 million, including additional pretax impairment charges for capital additions made to a bio-ethanol manufacturing facility in Santa Vitoria, Minas Gerais, Brazil ("Santa Vitoria"), which was impaired in 2017 and divested in 2020, as well as charges for miscellaneous write-offs and write-downs of non-manufacturing assets and the write-down of certain corporate leased equipment. The impairment charges related to Packaging & Specialty Plastics (\$19 million), Performance Materials & Coatings (\$15 million) and Corporate (\$15 million). See Note 23 for additional information.

2019 Charges

On August 13, 2019, the Company entered into a definitive agreement to sell its acetone derivatives business to ALTIVIA Ketones & Additives, LLC. The transaction closed on November 1, 2019 and included the Company's acetone derivatives related inventory and production assets, located in Institute, West Virginia, in addition to the site infrastructure, land, utilities and certain railcars. The Company remains at the Institute site as a tenant. As a result of the planned transaction, the Company recognized a pretax impairment charge of \$75 million in the third quarter of 2019, related to Packaging & Specialty Plastics (\$24 million) and Corporate (\$51 million). See Note 23 for additional information.

In the fourth quarter of 2019, upon completion of an evaluation of its equity method investment in Sadara Chemical Company ("Sadara") for other-than-temporary impairment, the Company determined that its investment in Sadara was other-than-temporarily impaired and it was written down to zero. Additionally, as part of Dow's evaluation of Sadara, the Company reserved certain of its notes and accounts receivable with Sadara due to uncertainty on the timing of collection. As a result, the Company recorded a \$1,755 million charge, related to Packaging & Specialty Plastics (\$370 million), Industrial Intermediates & Infrastructure (\$1,168 million) and Corporate (\$217 million). See Notes 12 and 23 for additional information.

In 2019, the Company recognized pretax impairment charges of \$58 million related primarily to capital additions at Santa Vitoria, and related to Packaging & Specialty Plastics (\$44 million), Performance Materials & Coatings (\$9 million) and Corporate (\$5 million). See Note 23 for additional information.

NOTE 7 – SUPPLEMENTARY INFORMATION

Sundry Income (Expense) – Net In millions	Dow Inc.			TDCC		
	2021	2020	2019	2021	2020	2019
Non-operating pension and other postretirement benefit plan net credits ¹	\$ 332	\$ 103	\$ 205	\$ 332	\$ 103	\$ 205
Foreign exchange gains (losses)	(8)	(62)	91	(13)	(65)	77
Loss on early extinguishment of debt ²	(574)	(149)	(102)	(574)	(149)	(102)
Gain on sales of other assets and investments	105	48	67	105	48	67
Luxi arbitration award ³	54	—	—	54	—	—
Indemnification and other transaction related credits (costs) ⁴	30	(21)	(69)	(2)	(11)	6
Gain (loss) on divestitures and asset sale ⁵	16	(15)	(49)	16	(15)	2
Gain on divestiture of rail infrastructure operations and assets ⁶	—	233	—	—	233	—
Gain on divestiture of marine and terminal operations and assets ⁶	—	499	—	—	499	—
Gain related to Nova ethylene asset matter ³	—	544	170	—	544	170
Dow Silicones breast implant liability adjustment ³	—	5	85	—	5	85
Loss on Dow Silicones commercial creditor matters ³	—	—	(50)	—	—	(50)
Other - net	10	84	113	3	82	113
Total sundry income (expense) – net	\$ (35)	\$ 1,269	\$ 461	\$ (79)	\$ 1,274	\$ 573

1. See Note 20 for additional information.

2. See Note 15 for additional information.

3. See Note 16 for additional information.

4. See Note 3 for additional information.

5. The year ended December 31, 2021 includes post-closing adjustments on a previous divestiture, related to Packaging & Specialty Plastics. The year ended December 31, 2020 primarily relates to a loss on the divestiture of a bio-ethanol manufacturing facility in Brazil, related to Packaging & Specialty Plastics. The year ended December 31, 2019 includes post-closing adjustments on previous divestitures, related to Corporate.

6. See Note 5 for additional information.

Accrued and Other Current Liabilities

"Accrued and other current liabilities" were \$3,481 million and \$3,299 million at December 31, 2021 and \$3,790 million and \$3,256 million at December 31, 2020, for Dow Inc. and TDCC, respectively. Accrued payroll, which is a component of "Accrued and other current liabilities" and includes liabilities related to payroll, performance-based compensation and severance, was \$1,030 million at December 31, 2021 and \$866 million at December 31, 2020. No other components of "Accrued and other current liabilities" were more than 5 percent of total current liabilities.

Other Investments

The Company has investments in company-owned life insurance policies ("COLI"), which are recorded at their cash surrender value as of each balance sheet date. The Company has the ability to monetize its investment in its COLI policies as an additional source of liquidity. In the first quarter of 2021, the Company monetized \$200 million of its existing COLI policies' value. In the second quarter of 2021, the Company repaid the drawdown against the cash surrender value. The Company had no outstanding monetization of its existing COLI policies' surrender value at December 31, 2021. In the first nine months of 2020, the Company monetized \$211 million of its existing COLI policies' value. In the fourth quarter of 2020, the Company repaid all existing drawdowns against the cash surrender value, which resulted in no monetization of its existing COLI policies' value at December 31, 2020. The repayments were reflected in "Purchases of investments" in the consolidated statements of cash flows.

Supplemental Cash Flow Information

The following table shows cash paid for interest and income taxes for the years ended December 31, 2021, 2020 and 2019:

Supplemental Cash Flow Information			
In millions	2021	2020	2019
Cash paid during year for:			
Interest	\$ 801	\$ 842	\$ 993
Income taxes	\$ 731	\$ 518	\$ 881

NOTE 8 – INCOME TAXES

The financial statements for Dow Inc. and TDCC are substantially similar, including the reporting of current and deferred tax expense (benefit), provision for income taxes on continuing operations, and deferred tax asset and liability balances. As a result, the following income tax discussion pertains to Dow Inc. only.

Geographic Allocation of Income and Provision for Income Taxes on Continuing Operations			
In millions	2021	2020	2019
Income (loss) from continuing operations before income taxes			
Domestic ¹	\$ 1,523	\$ (681)	\$ (1,196)
Foreign ²	6,622	2,752	(51)
Income (loss) from continuing operations before income taxes	\$ 8,145	\$ 2,071	\$ (1,247)
Current tax expense (benefit)			
Federal	\$ (46)	\$ (176)	\$ (287)
State and local	48	4	25
Foreign	1,460	691	960
Total current tax expense	\$ 1,462	\$ 519	\$ 698
Deferred tax expense (benefit)			
Federal	\$ 130	\$ 184	\$ 52
State and local	26	19	19
Foreign	122	55	(299)
Total deferred tax expense (benefit)	\$ 278	\$ 258	\$ (228)
Provision for income taxes on continuing operations	\$ 1,740	\$ 777	\$ 470
Income (loss) from continuing operations, net of tax	\$ 6,405	\$ 1,294	\$ (1,717)

1. The 2019 amount includes approximately \$1.4 billion of expense related to goodwill impairment and environmental matters. See Notes 13 and 16 for additional information.

2. The 2019 amount includes approximately \$1.8 billion of expense for Sadara related charges. See Note 12 for additional information.

Reconciliation to U.S. Statutory Rate	2021	2020 ¹	2019 ¹
Statutory U.S. federal income tax rate	21.0 %	21.0 %	21.0 %
Equity earnings effect	(2.2)	0.2	(3.2)
Foreign income taxed at rates other than the statutory U.S. federal income tax rate	(1.3)	(2.3)	(14.8)
U.S. tax effect of foreign earnings and dividends	1.7	3.9	1.9
Unrecognized tax benefits	4.7	7.3	1.0
Divestitures ²	—	(5.1)	—
Changes in valuation allowances	2.6	12.6	—
Impact of tax reform ³	—	—	11.1
Federal tax accrual adjustment ⁴	(5.3)	0.3	10.4
State and local income taxes	0.2	0.3	(4.4)
Sadara related charges ⁵	—	—	(29.5)
Goodwill impairment ⁶	—	—	(17.5)
Other - net	—	(0.7)	(13.7)
Effective tax rate	21.4 %	37.5 %	(37.7)%

1. Certain prior year rates have been adjusted to conform with the current year presentation.

2. The 2020 impact relates to the divestiture of a bio-ethanol manufacturing facility in Brazil. See Note 6 for additional information.

3. Includes the impact of tax reform in Switzerland and the United States.

4. The 2021 impact represents a capital loss incurred on an internal restructuring fully offset by a valuation allowance reported in "Changes in valuation allowances" line item.

The 2019 impact primarily relates to the favorable impact of the restoration of tax basis in assets, driven by a court judgment that did not involve the Company.

5. See Note 12 for additional information.

6. See Note 13 for additional information.

The Coronavirus Aid, Relief, and Economic Security Act ("CARES Act") was enacted on March 27, 2020 in the United States. While the CARES Act had no significant impact on the Company's provision for income taxes on continuing operations in 2020, the Company filed a tax loss carryback claim for \$291 million in accordance with the provisions of the CARES Act in 2020. This resulted in an increase in "Accounts and notes receivable - other" and a decrease in "Deferred income tax assets" in the consolidated balance sheets. In 2021, the Company received \$247 million of the tax loss carryback claim with the residual balance expected to be received in 2022.

In the fourth quarter of 2020, a valuation allowance of \$260 million was recorded in the United States, primarily due to filing of the final combined Dow and DuPont tax return and related unutilized foreign tax credits. In 2021, the Company's strong earnings and revised projections resulted in a reversal of the valuation allowance.

Deferred Tax Balances at Dec 31	2021		2020 ¹	
	<i>Assets</i>	<i>Liabilities</i>	<i>Assets</i>	<i>Liabilities</i>
In millions				
Property	\$ 484	\$ 3,150	\$ 448	\$ 3,337
Tax loss and credit carryforwards	1,784	—	2,004	—
Postretirement benefit obligations	1,753	303	2,712	250
Other accruals and reserves	1,487	191	1,542	78
Intangibles	108	556	124	638
Inventory	33	203	30	198
Investments	31	26	142	51
Other – net	1,093	101	858	196
Subtotal	\$ 6,773	\$ 4,530	\$ 7,860	\$ 4,748
Valuation allowances	(1,391)	—	(1,302)	—
Total	\$ 5,382	\$ 4,530	\$ 6,558	\$ 4,748

1. Certain prior year balances have been adjusted to conform with the current year presentation.

Operating Loss and Tax Credit Carryforwards at Dec 31 In millions	2021	2020
	Assets	Assets
Operating loss carryforwards		
Expire within 5 years	\$ 240	\$ 274
Expire after 5 years or indefinite expiration	817	1,031
Total operating loss carryforwards	\$ 1,057	\$ 1,305
Tax credit carryforwards		
Expire within 5 years	\$ 227	\$ 434
Expire after 5 years or indefinite expiration	103	265
Total tax credit carryforwards	\$ 330	\$ 699
Capital loss carryforwards		
Expire within 5 years	\$ 397	\$ —
Total tax loss and tax credit carryforwards	\$ 1,784	\$ 2,004

Undistributed earnings of foreign subsidiaries and related companies that are deemed to be permanently invested amounted to \$7,769 million at December 31, 2021 and \$7,401 million at December 31, 2020. Undistributed earnings are subject to certain taxes upon repatriation, primarily where foreign withholding taxes apply. It is not practicable to calculate the unrecognized deferred tax liability on undistributed earnings.

Prior to the separation, TDCC and its consolidated subsidiaries were included in DowDuPont's consolidated federal income tax group and consolidated tax return. Generally, the consolidated tax liability of the DowDuPont U.S. tax group for each year was apportioned among the members of the consolidated group based on each member's separate taxable income. TDCC and DuPont intend that, to the extent federal and/or state corporate income tax liabilities are reduced through the utilization of tax attributes of the other, settlement of any receivable and payable generated from the use of the other party's sub-group attributes will be in accordance with a tax sharing agreement and/or tax matters agreement. At December 31, 2021, the Company had a receivable of zero related to the tax sharing agreement (\$261 million at December 31, 2020), included in "Other current assets" in the consolidated balance sheets. Balances related to the tax matters agreement are further discussed in Note 3.

The following table provides a reconciliation of the Company's unrecognized tax benefits:

Total Gross Unrecognized Tax Benefits In millions	2021	2020	2019
Total unrecognized tax benefits at Jan 1	\$ 373	\$ 319	\$ 314
Decreases related to positions taken on items from prior years	(3)	(1)	(1)
Increases related to positions taken on items from prior years	187	52	16
Increases related to positions taken in the current year	44	18	10
Settlement of uncertain tax positions with tax authorities	(18)	(14)	(19)
Decreases due to expiration of statutes of limitations	(1)	(1)	—
Foreign exchange gain	(2)	—	(1)
Total unrecognized tax benefits at Dec 31	\$ 580	\$ 373	\$ 319
Total unrecognized tax benefits that, if recognized, would impact the effective tax rate	\$ 501	\$ 285	\$ 234
Total amount of interest and penalties expense (benefit) recognized in "Provision for income taxes on continuing operations"	\$ 359	\$ 84	\$ (11)
Total accrual for interest and penalties recognized in the consolidated balance sheets	\$ 502	\$ 144	\$ 100

The 2021 impacts primarily relate to an increase in uncertain tax positions due to controversy in multiple jurisdictions related to various prior year cross-border matters.

The Company files tax returns in the multiple jurisdictions. These returns are subject to examination and possible challenge by the tax authorities. Open tax years are indicated in the table below.

Tax Years Subject to Examination by Major Tax Jurisdiction at Dec 31, 2021	<i>Earliest Open Year</i>
<i>Jurisdiction</i>	
Argentina	2014
Brazil	2015
Canada	2012
China	2011
Germany	2014
Italy	2016
The Netherlands	2019
Switzerland	2016
United States:	
Federal income tax	2007
State and local income tax	2004

Open years contain matters that could be subject to differing interpretations of applicable tax laws and regulations as they relate to the amount, character, timing or inclusion of revenue and expenses or the sustainability of income tax credits for a given audit cycle. The ultimate resolution of such uncertainties is not expected to have a material impact on the Company's results of operations.

NOTE 9 - EARNINGS PER SHARE CALCULATIONS

The following tables provide earnings per share calculations of Dow Inc. for the years ended December 31, 2021, 2020 and 2019. In accordance with the accounting guidance for earnings per share, earnings per share of TDCC is not presented as this information is not required in financial statements of wholly owned subsidiaries.

Net Income (Loss) for Earnings Per Share Calculations	2021	2020	2019
In millions			
Income (loss) from continuing operations, net of tax	\$ 6,405	\$ 1,294	\$ (1,717)
Net income attributable to noncontrolling interests - continuing operations	(94)	(69)	(74)
Net income attributable to participating securities - continuing operations ¹	(32)	(9)	(6)
Income (loss) from continuing operations attributable to common stockholders	\$ 6,279	\$ 1,216	\$ (1,797)
Income from discontinued operations, net of tax	\$ —	\$ —	\$ 445
Net income attributable to noncontrolling interests - discontinued operations	—	—	(13)
Income from discontinued operations attributable to common stockholders	\$ —	\$ —	\$ 432
Net income (loss) attributable to common stockholders	\$ 6,279	\$ 1,216	\$ (1,365)

Earnings (Loss) Per Share Calculations - Basic	2021	2020	2019
Dollars per share			
Income (loss) from continuing operations attributable to common stockholders	\$ 8.44	\$ 1.64	\$ (2.42)
Income from discontinued operations, net of tax	—	—	0.58
Net income (loss) attributable to common stockholders	\$ 8.44	\$ 1.64	\$ (1.84)

Earnings (Loss) Per Share Calculations - Diluted	2021	2020	2019
Dollars per share			
Income (loss) from continuing operations attributable to common stockholders	\$ 8.38	\$ 1.64	\$ (2.42)
Income from discontinued operations, net of tax	—	—	0.58
Net income (loss) attributable to common stockholders	\$ 8.38	\$ 1.64	\$ (1.84)

Share Count Information	2021	2020	2019
Shares in millions			
Weighted-average common shares outstanding - basic	743.6	740.5	742.5
Plus dilutive effect of equity compensation plans ²	5.4	1.8	—
Weighted-average common shares outstanding - diluted ²	749.0	742.3	742.5
Stock options and restricted stock units excluded from EPS calculations ³	5.8	14.2	20.8

1. Restricted stock units are considered participating securities due to the Company's practice of paying dividend equivalents on unvested shares.
2. The year ended December 31, 2019 reflected a loss from continuing operations, and as such, the basic share count was used for purposes of calculating earnings per share on a diluted basis.
3. These outstanding options to purchase shares of common stock and restricted stock units were excluded from the calculation of diluted earnings per share because the effect of including them would have been antidilutive.

NOTE 10 – INVENTORIES

The following table provides a breakdown of inventories:

Inventories at Dec 31	2021	2020
In millions		
Finished goods	\$ 4,554	\$ 3,140
Work in process	1,615	996
Raw materials	822	598
Supplies	866	933
Total	\$ 7,857	\$ 5,667
Adjustment of inventories to the LIFO basis	(485)	34
Total inventories	\$ 7,372	\$ 5,701

Inventories valued on the LIFO basis represented 27 percent of the total inventories at December 31, 2021 and 30 percent of the total inventories at December 31, 2020.

NOTE 11 – PROPERTY

The following table provides a breakdown of property:

Property at Dec 31	Estimated Useful Lives (Years)	2021	2020
In millions			
Land and land improvements	0-25	\$ 2,045	\$ 2,011
Buildings	5-50	5,108	4,976
Machinery and equipment	3-25	42,627	42,108
Other property	3-50	6,286	5,626
Construction in progress	—	1,538	1,604
Total property		\$ 57,604	\$ 56,325

	2021	2020	2019
In millions			
Depreciation expense	\$ 2,063	\$ 2,092	\$ 2,156
Capitalized interest	\$ 59	\$ 64	\$ 80

NOTE 12 – NONCONSOLIDATED AFFILIATES

The Company's investments in companies accounted for using the equity method ("nonconsolidated affiliates"), by classification in the consolidated balance sheets, and dividends received from nonconsolidated affiliates are shown in the following tables:

Investments in Nonconsolidated Affiliates at Dec 31		
In millions		
Investment in nonconsolidated affiliates	\$ 2,045	\$ 1,327
Other noncurrent obligations	—	(169)
Net investment in nonconsolidated affiliates	\$ 2,045	\$ 1,158

1. The carrying amount of the Company's investments in nonconsolidated affiliates at December 31, 2021 and 2020 was \$55 million less than its share of the investees' net assets, exclusive of additional differences relating to Sadara, EQUATE Petrochemical Company K.S.C.C. ("EQUATE") and AgroFresh Solutions Inc. ("AFSI"), which are discussed separately in the disclosures that follow.

Dividends Received from Nonconsolidated Affiliates			
In millions			
Dividends from nonconsolidated affiliates ¹	\$ 324	\$ 425	\$ 1,020

1. Included in "Earnings of nonconsolidated affiliates less than (in excess of) dividends received" in the consolidated statements of cash flows.

Except for AFSI, the nonconsolidated affiliates in which the Company has investments are privately held companies; therefore, quoted market prices are not available.

Sadara

In 2011, the Company and Saudi Arabian Oil Company formed Sadara - a joint venture between the two companies that subsequently constructed and now operates a world-scale, fully integrated chemicals complex in Jubail Industrial City, Kingdom of Saudi Arabia. The Company has a 35 percent equity interest in this joint venture and has been, and continues to be, responsible for marketing the majority of Sadara's products through the Company's established sales channels. In 2021, Dow and the Saudi Arabian Oil Company agreed to and began transitioning the marketing rights and responsibilities for Sadara's finished products to levels more consistent with each partner's equity ownership.

The Company's investment in Sadara was \$1,541 million less than Dow's proportionate share of the carrying value of the underlying net assets held by Sadara at December 31, 2021 (\$1,618 million less at December 31, 2020). This basis difference is primarily attributed to the long-lived assets of Sadara and is being amortized over the remaining useful lives of the assets. At December 31, 2021, the Company had an investment balance in Sadara of \$416 million included in "Investment in nonconsolidated affiliates" (negative \$22 million at December 31, 2020 included in "Other noncurrent obligations") in the Company's consolidated balance sheets. See Note 16 for additional information related to guarantees.

In 2019, the Company recorded impairment charges related to its investment in Sadara. The joint venture achieved full commercial operations of all its facilities in 2017. In December 2018, the joint venture successfully completed its Creditors Reliability Test, an extensive operational testing program designed to demonstrate the reliability of the joint venture's full chemical complex by operating at high rates for an extended period of time. While Sadara had reached these operational milestones and had been generating positive EBITDA (a non-GAAP measure defined as earnings before interest, taxes, depreciation and amortization), the joint venture had yet to report positive net income. During the fourth quarter of 2019, Sadara tested its long-lived assets for impairment using long-term cash flow projections. Sadara's U.S. GAAP impairment test utilized an undiscounted cash flow methodology, under which Sadara concluded its long-lived assets were recoverable. Due to Sadara's financial condition and its long-lived asset impairment test, Dow evaluated its equity method investment in Sadara for other-than-temporary impairment. The Company utilized a discounted cash flow methodology to measure the estimated fair value of its investment in Sadara, which was estimated to be zero (see Note 23 for additional information on the fair value measurement). The Company determined the decline in value of its investment in Sadara was other-than-temporary due to Sadara's financial performance since becoming commercially operational in 2017 and uncertainty around prospects for recovery in Sadara's financial condition. In addition, the Company reserved certain accounts and notes receivable and accrued interest balances associated with Sadara due to uncertainty around the timing of collection. In total, the Company recorded a \$1,755 million pretax charge in the fourth quarter of 2019 related to Sadara, included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of

income and related to Packaging & Specialty Plastics (\$370 million), Industrial Intermediates & Infrastructure (\$1,168 million) and Corporate (\$217 million).

In 2020, the Company loaned \$333 million to Sadara that was accounted for as in substance common stock and classified as "Investment in nonconsolidated affiliates" in the Company's consolidated balance sheets. The Company loaned \$473 million to Sadara and converted \$380 million of the notes and accounts receivable into equity during 2019. At December 31, 2021 and 2020, the Company's note receivable with Sadara was zero.

EQUATE

At December 31, 2021, the Company had an investment balance in EQUATE of \$115 million included in "Investment in nonconsolidated affiliates" (negative \$147 million at December 31, 2020 included in "Other noncurrent obligations") in the consolidated balance sheets. The Company's investment in EQUATE was \$458 million less than the Company's proportionate share of EQUATE's underlying net assets at December 31, 2021 (\$475 million less at December 31, 2020), which represents the difference between the fair values of certain MEGlobal assets acquired by EQUATE and the Company's related valuation on a U.S. GAAP basis. A basis difference of \$140 million at December 31, 2021 (\$155 million at December 31, 2020) is being amortized over the remaining useful lives of the assets and the remainder is considered a permanent difference.

AFSI

At December 31, 2021 and 2020, the Company had an investment balance in AFSI of zero. At December 31, 2021, the Company's investment in AFSI was \$96 million less than the Company's proportionate share of AFSI's underlying net assets (\$108 million less at December 31, 2020). This amount primarily relates to an other-than-temporary decline in the Company's investment in AFSI. At December 31, 2021 and 2020, the Company held a 40 percent ownership interest in AFSI.

Transactions with Nonconsolidated Affiliates

The Company has service agreements with certain nonconsolidated affiliates, including contracts to manage the operations of manufacturing sites and the construction of new facilities; licensing and technology agreements; and marketing, sales, purchase, lease and sublease agreements.

The Company sells excess ethylene glycol produced at manufacturing facilities in the United States and Europe to MEGlobal, a subsidiary of EQUATE. The Company also sells ethylene to MEGlobal as a raw material for its ethylene glycol plants in Canada. Sales of these products to MEGlobal represented 1 percent of total net sales in 2021, 2020 and 2019. Sales of ethylene to MEGlobal are reflected in the Packaging & Specialty Plastics segment and represented 2 percent of the segment's sales in 2021 (2 percent in 2020 and 1 percent in 2019). Sales of ethylene glycol to MEGlobal are reflected in the Industrial Intermediates & Infrastructure segment and represented 1 percent of the segment's sales in 2021, 2020 and 2019.

The Company is responsible for marketing the majority of Sadara products outside of the Middle East zone through the Company's established sales channels. Under this arrangement, the Company purchases and sells Sadara products for a marketing fee. In March 2021, Dow and the Saudi Arabian Oil Company agreed to transition the marketing rights and responsibilities for Sadara's finished products to levels more consistent with each partner's equity ownership. This transition began in July 2021 and is being implemented over the next five years. Purchases of Sadara products represented 9 percent of "Cost of sales" in 2021 (8 percent in 2020 and 2019).

The Company purchases products from The SCG-Dow Group, primarily for marketing and distribution in Asia Pacific. Purchases of products from The SCG-Dow Group represented 3 percent of "Cost of sales" in 2021 (3 percent in 2020 and 2 percent in 2019).

Sales to and purchases from other nonconsolidated affiliates were not material to the consolidated financial statements.

Balances due to or due from nonconsolidated affiliates at December 31, 2021 and 2020 were as follows:

Balances Due To or Due From Nonconsolidated Affiliates at Dec 31		
In millions	2021	2020
Accounts and notes receivable - Other	\$ 357	\$ 229
Accounts payable - Other	\$ 1,611	\$ 1,075

Principal Nonconsolidated Affiliates

The Company had an ownership interest in 37 nonconsolidated affiliates at December 31, 2021 (35 at December 31, 2020). The Company's principal nonconsolidated affiliates and its ownership interest (direct and indirect) for each at December 31, 2021, 2020 and 2019 are as follows:

Principal Nonconsolidated Affiliates at Dec 31	Country	Ownership Interest		
		2021	2020	2019
EQUATE Petrochemical Company K.S.C.C.	Kuwait	42.5 %	42.5 %	42.5 %
The Kuwait Olefins Company K.S.C.C.	Kuwait	42.5 %	42.5 %	42.5 %
The Kuwait Styrene Company K.S.C.C.	Kuwait	42.5 %	42.5 %	42.5 %
Map Ta Phut Olefins Company Limited ¹	Thailand	32.77 %	32.77 %	32.77 %
Sadara Chemical Company	Saudi Arabia	35 %	35 %	35 %
The SCG-Dow Group:				
Siam Polyethylene Company Limited	Thailand	50 %	50 %	50 %
Siam Polystyrene Company Limited	Thailand	50 %	50 %	50 %
Siam Styrene Monomer Company Limited	Thailand	50 %	50 %	50 %
Siam Synthetic Latex Company Limited	Thailand	50 %	50 %	50 %

1. The Company's effective ownership of Map Ta Phut Olefins Company Limited ("Map Ta Phut") is 32.77 percent, of which the Company directly owns 20.27 percent and indirectly owns 12.5 percent through its equity interest in Siam Polyethylene Company Limited.

The Company's investment in and equity earnings from its principal nonconsolidated affiliates are as follows:

Investment in Principal Nonconsolidated Affiliates at Dec 31	2021	2020
In millions		
Investment in nonconsolidated affiliates	\$ 1,621	\$ 922
Other noncurrent obligations	—	(169)
Net investment in principal nonconsolidated affiliates	\$ 1,621	\$ 753

Equity in Earnings (Losses) of Principal Nonconsolidated Affiliates	2021	2020	2019
In millions			
Equity in earnings (losses) of principal nonconsolidated affiliates	\$ 918	\$ (16)	\$ 21

The summarized financial information that follows represents the combined accounts (at 100 percent) of the principal nonconsolidated affiliates.

Summarized Balance Sheet Information at Dec 31	2021	2020
In millions		
Current assets	\$ 8,158	\$ 5,044
Noncurrent assets	23,681	25,298
Total assets	\$ 31,839	\$ 30,342
Current liabilities	\$ 3,990	\$ 3,942
Noncurrent liabilities	20,039	20,144
Total liabilities	\$ 24,029	\$ 24,086
Noncontrolling interests	\$ 174	\$ 132

Summarized Income Statement Information ¹	2021	2020	2019
In millions			
Sales	\$ 14,969	\$ 9,470	\$ 10,905
Gross profit	\$ 3,219	\$ 619	\$ 644
Income (loss) from continuing operations, net of tax	\$ 2,013	\$ (461)	\$ (277)

1. The results in this table include purchase and sale activity between certain principal nonconsolidated affiliates and the Company, as previously discussed in the "Transactions with Nonconsolidated Affiliates" section.

NOTE 13 – GOODWILL AND OTHER INTANGIBLE ASSETS

The following table shows changes in the carrying amounts of goodwill by reportable segment for the years ended December 31, 2021 and 2020:

Goodwill				
In millions	<i>Packaging & Specialty Plastics</i>	<i>Industrial Intermediates & Infrastructure</i>	<i>Performance Materials & Coatings</i>	<i>Total</i>
Balance at Jan 1, 2020	\$ 5,109	\$ 1,100	\$ 2,587	\$ 8,796
Foreign currency impact	12	4	106	122
Sale of rail infrastructure	(2)	—	—	(2)
Sale of marine and terminal infrastructure	(4)	(4)	—	(8)
Balance at Dec 31, 2020	\$ 5,115	\$ 1,100	\$ 2,693	\$ 8,908
Foreign currency impact	(10)	(4)	(130)	(144)
Balance at Dec 31, 2021	\$ 5,105	\$ 1,096	\$ 2,563	\$ 8,764

The separation from DowDuPont did not impact the composition of the Company's six reporting units: Coatings & Performance Monomers, Consumer Solutions, Hydrocarbons & Energy, Industrial Solutions, Packaging and Specialty Plastics and Polyurethanes & Construction Chemicals. The ECP businesses received as part of the separation from DowDuPont are included in the Hydrocarbons & Energy and Packaging and Specialty Plastics reporting units. At December 31, 2021, goodwill was carried by all reporting units except Coatings & Performance Monomers ("C&PM").

Goodwill Impairments

The carrying amounts of goodwill at December 31, 2021 and 2020 were net of accumulated impairments of \$309 million in Industrial Intermediates & Infrastructure and \$2,530 million in Performance Materials & Coatings.

Goodwill Impairment Testing

The Company performs an impairment test of goodwill annually in the fourth quarter. In 2021, the Company performed qualitative testing for all reporting units that carried goodwill. Based on the results of the qualitative testing, the Company did not perform quantitative testing on any reporting units (one in 2020 and two in 2019). The qualitative testing on the reporting units indicated that it was not more likely than not that fair value was less than the carrying value for the reporting units.

The quantitative testing conducted in 2020 concluded that no goodwill impairments existed.

Upon completion of the quantitative testing in the fourth quarter of 2019, the Company determined the C&PM reporting unit was impaired. During 2019, the C&PM reporting unit did not consistently meet expected financial performance targets, primarily due to the industry's increased captive use of coatings products, which led to volume reductions; reduced margins for products across the portfolio due to changes in customer buying patterns and supply and demand balances; as well as a continuous trend of customer consolidation in end-markets, which reduced growth opportunities. As a result, the C&PM reporting unit lowered its future revenue and profitability projections. The fair value of the C&PM reporting unit was determined using a discounted cash flow methodology that reflected reductions in projected revenue growth rates due to lower sales volume and price assumptions, as well as reductions to future growth rates. These discounted cash flows did not support the carrying value of the C&PM reporting unit. As a result, the Company recorded a goodwill impairment charge of \$1,039 million in the fourth quarter of 2019, included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to the Performance Materials & Coatings segment. The carrying value of the C&PM reporting unit's goodwill was zero at December 31, 2019. No other goodwill impairments were identified as a result of the 2019 testing.

Other Intangible Assets

The following table provides information regarding the Company's other intangible assets:

Other Intangible Assets at Dec 31	2021			2020		
	Gross Carrying Amount	Accum Amort	Net	Gross Carrying Amount	Accum Amort	Net
In millions						
Intangible assets with finite lives:						
Developed technology	\$ 2,637	\$ (1,871)	\$ 766	\$ 2,638	\$ (1,677)	\$ 961
Software	1,396	(945)	451	1,489	(989)	500
Trademarks/tradenames	352	(344)	8	352	(343)	9
Customer-related	3,204	(1,565)	1,639	3,301	(1,419)	1,882
Total other intangible assets, finite lives	\$ 7,589	\$ (4,725)	\$ 2,864	\$ 7,780	\$ (4,428)	\$ 3,352
In-process research and development	17	—	17	—	—	—
Total other intangible assets	\$ 7,606	\$ (4,725)	\$ 2,881	\$ 7,780	\$ (4,428)	\$ 3,352

The following table provides information regarding amortization expense from continuing operations related to intangible assets:

Amortization Expense from Continuing Operations	2021	2020	2019
In millions			
Other intangible assets, excluding software	\$ 388	\$ 401	\$ 419
Software, included in "Cost of sales"	\$ 90	\$ 96	\$ 96

Total estimated amortization expense from continuing operations for the next five fiscal years, including amounts expected to be capitalized, is as follows:

Estimated Amortization Expense for Next Five Years	
In millions	
2022	\$ 418
2023	\$ 386
2024	\$ 367
2025	\$ 276
2026	\$ 202

NOTE 14 – TRANSFERS OF FINANCIAL ASSETS

Accounts Receivable Programs

The Company maintains committed accounts receivable facilities with various financial institutions, including in the United States, which expires in November 2022 ("U.S. A/R Program") and in Europe, which expires in July 2023 ("Europe A/R Program" and together with the U.S. A/R Program, "the Programs"). Under the terms of the Programs, the Company may sell certain eligible trade accounts receivable at any point in time, up to \$900 million for the U.S. A/R Program and up to €500 million for the Europe A/R Program. Under the terms of the Programs, the Company continues to service the receivables from the customer, but retains no interest in the receivables, and remits payment to the financial institutions. The Company also provides a guarantee to the financial institutions for the creditworthiness and collection of the receivables in satisfaction of the facility. See Note 16 for additional information related to guarantees. There were no receivables sold under the Programs during the years ended December 31, 2021 and 2020.

NOTE 15 – NOTES PAYABLE, LONG-TERM DEBT AND AVAILABLE CREDIT FACILITIES

Notes Payable at Dec 31		2021	2020
In millions			
Notes payable to banks and other lenders	\$	161	\$ 156
Year-end average interest rates		5.78 %	3.89 %

Long-Term Debt at Dec 31	2021 Average Rate	2021	2020 Average Rate	2020
In millions				
Promissory notes and debentures:				
Final maturity 2021	— %	\$ —	8.95 %	\$ 173
Final maturity 2022	8.64 %	121	8.64 %	121
Final maturity 2023	7.63 %	250	7.63 %	250
Final maturity 2024	— %	—	3.43 %	1,017
Final maturity 2025	5.63 %	333	5.13 %	625
Final maturity 2026	3.63 %	750	3.63 %	750
Final maturity 2027 and thereafter ¹	5.15 %	9,363	5.34 %	10,138
Other facilities:				
Foreign currency notes and loans, various rates and maturities	1.17 %	2,730	1.41 %	3,189
InterNotes®, varying maturities through 2051	3.37 %	392	3.56 %	535
Finance lease obligations ²		869		518
Unamortized debt discount and issuance costs		(297)		(365)
Long-term debt due within one year ³		(231)		(460)
Long-term debt		\$ 14,280		\$ 16,491

1. Cost includes net fair value hedge adjustment gains of \$47 million at December 31, 2021 (\$69 million at December 31, 2020). See Note 22 for additional information.

2. See Note 17 for additional information.

3. Presented net of current portion of unamortized debt issuance costs.

Maturities of Long-Term Debt for Next Five Years at Dec 31, 2021	
In millions	
2022	\$ 231
2023	\$ 386
2024	\$ 78
2025	\$ 385
2026	\$ 828

2021 Activity

In the second quarter of 2021, the Company redeemed \$208 million aggregate principal amount of 3.15 percent notes due May 2024 and \$811 million aggregate principal amount of 3.50 percent notes due October 2024. As a result of the redemptions, the Company recognized a pretax loss of \$101 million on the early extinguishment of debt, included in "Sundry income (expense) - net" in the consolidated statements of income and related to Corporate.

In the third quarter of 2021, the Company completed cash tender offers for certain debt securities. In total, \$1,042 million aggregate principal amount was tendered and retired. As a result, the Company recognized a pretax loss of \$472 million on the early extinguishment of debt, included in "Sundry income (expense) – net" in the consolidated statements of income and related to Corporate. In addition, the Company voluntarily repaid \$81 million of long-term debt due within one year.

In 2021, the Company issued an aggregate principal amount of \$109 million of InterNotes®, and redeemed an aggregate principal amount of \$31 million at maturity. In addition, the Company voluntarily repaid an aggregate principal amount of \$213 million of InterNotes® with various maturities. As a result, the Company recognized a pretax loss of \$1 million on the early extinguishment of debt, included in "Sundry income (expense) - net" in the consolidated statements of income and related to Corporate. Additionally, the Company repaid \$259 million of long-term debt at maturity and approximately \$25 million of long-term debt was repaid by consolidated variable interest entities.

2020 Activity

In February 2020, the Company issued €2.25 billion aggregate principal amount of notes ("Euro Notes"). The Euro Notes included €1.0 billion aggregate principal amount of 0.50 percent notes due 2027, €750 million aggregate principal amount of 1.125 percent notes due 2032 and €500 million aggregate principal amount of 1.875 percent notes due 2040. The Euro Notes have a weighted average coupon rate of approximately 1.0 percent. With the net proceeds from the issuance of the Euro Notes, Dow Silicones voluntarily repaid \$750 million of principal under a certain third party credit agreement ("Term Loan Facility"). In addition, the Company redeemed \$1.25 billion of 3.0 percent notes issued by the Company with maturity in 2022. As a result, the Company recognized a pretax loss of \$85 million on the early extinguishment of debt, included in "Sundry income (expense) – net" in the consolidated statements of income and related to Corporate.

In the first quarter of 2020, the Company withdrew \$800 million under various uncommitted bilateral credit arrangements, which were subsequently repaid in the second quarter of 2020.

In August 2020, the Company issued \$2.0 billion aggregate principal amount of notes. The notes included \$850 million aggregate principal amount of 2.1 percent notes due 2030 and \$1.15 billion aggregate principal amount of 3.6 percent notes due 2050 (together, the "Notes"). With the net proceeds from the issuance of the Notes, Dow Silicones voluntarily repaid the remaining \$1.25 billion outstanding principal balance under the Term Loan Facility. In September 2020, the Company also used \$556 million of aggregate proceeds from the Notes to fund cash tender offers for certain of its debt securities and certain debt securities of Union Carbide. In total, \$493 million aggregate principal amount was tendered and retired. These actions resulted in a pretax loss of \$62 million on the early extinguishment of debt included in "Sundry income (expense) – net" in the consolidated statements of income and related to Corporate.

In 2020, the Company also issued an aggregate principal amount of \$190 million of InterNotes® and redeemed an aggregate principal amount of \$180 million at maturity. In addition, the Company voluntarily repaid an aggregate principal amount of \$400 million of InterNotes® with various maturities. As a result, the Company recognized a pretax loss on the early extinguishment of debt of \$2 million, included in "Sundry income (expense) – net" in the consolidated statements of income and related to Corporate. Additionally, the Company repaid \$134 million of long-term debt at maturity and approximately \$29 million of long-term debt was repaid by consolidated variable interest entities.

2019 Activity

In 2019, the Company issued \$2 billion of senior unsecured notes in an offering under Rule 144A of the Securities Act of 1933. The offering included \$750 million aggregate principal amount of 4.80 percent notes due 2049; \$750 million aggregate principal amount of 3.625 percent notes due 2026; and \$500 million aggregate principal amount of 3.15 percent notes due 2024. In addition, the Company redeemed \$1.5 billion of 4.25 percent notes with maturity in 2020 and \$1.25 billion of 4.125 percent notes with maturity in 2021. As a result, the Company recognized a pretax loss of \$100 million on the early extinguishment of debt, included in "Sundry income (expense) - net" in the consolidated statements of income and related to Corporate. The Company also issued an aggregate principal amount of \$277 million of InterNotes® and redeemed an aggregate principal amount of \$122 million at maturity. Approximately \$149 million of long-term debt (net of \$16 million of issuances) was repaid by consolidated variable interest entities.

In 2019, Dow Silicones voluntarily repaid \$2.5 billion of principal under the Term Loan Facility. As a result, Dow Silicones recognized a pretax loss of \$2 million on the early extinguishment of debt, included in "Sundry income (expense) - net" in the consolidated statements of income and related to Corporate.

In October 2019, TDCC launched exchange offers for \$4 billion of all the outstanding, unregistered senior notes that were issued in private offerings on November 30, 2018 and May 20, 2019, for identical, registered notes under the Securities Act of 1933 (the “Exchange Offers”). The Exchange Offers were with respect to the Company’s 3.15 percent notes due 2024, 4.55 percent notes due 2025, 3.625 percent notes due 2026, 4.80 percent notes due 2028, 5.55 percent notes due 2048 and 4.80 percent notes due 2049, and fulfilled the Company’s obligations contained in the registration rights agreements entered into in connection with the issuance of the aforementioned notes.

Available Credit Facilities

The following table summarizes the Company’s credit facilities:

Committed and Available Credit Facilities at Dec 31, 2021				
In millions	<i>Committed Credit</i>	<i>Credit Available</i>	<i>Maturity Date</i>	<i>Interest</i>
Five Year Competitive Advance and Revolving Credit Facility	\$ 5,000	\$ 5,000	November 2026	Floating rate
Bilateral Revolving Credit Facility	150	150	March 2022	Floating rate
Bilateral Revolving Credit Facility	100	100	June 2022	Floating rate
Bilateral Revolving Credit Facility	200	200	September 2022	Floating rate
Bilateral Revolving Credit Facility	200	200	November 2022	Floating rate
Bilateral Revolving Credit Facility	200	200	September 2023	Floating rate
Bilateral Revolving Credit Facility	250	250	September 2023	Floating rate
Bilateral Revolving Credit Facility	300	300	September 2023	Floating rate
Bilateral Revolving Credit Facility	300	300	December 2023	Floating rate
Bilateral Revolving Credit Facility	300	300	December 2023	Floating rate
Bilateral Revolving Credit Facility	100	100	October 2024	Floating rate
Bilateral Revolving Credit Facility	200	200	November 2024	Floating rate
Bilateral Revolving Credit Facility	100	100	March 2025	Floating rate
Bilateral Revolving Credit Facility	250	250	March 2025	Floating rate
Bilateral Revolving Credit Facility	350	350	March 2025	Floating rate
Bilateral Revolving Credit Facility	100	100	October 2026	Floating rate
Total Committed and Available Credit Facilities	\$ 8,100	\$ 8,100		

Letters of Credit

The Company utilizes letters of credit to support commitments made in the ordinary course of business. While the terms and amounts of letters of credit change, the Company generally has approximately \$400 million of outstanding letters of credit at any given time.

Debt Covenants and Default Provisions

TDCC’s outstanding long-term debt has been issued primarily under indentures which contain, among other provisions, certain customary restrictive covenants with which TDCC must comply while the underlying notes are outstanding. Failure of TDCC to comply with any of its covenants, could result in a default under the applicable indenture and allow the note holders to accelerate the due date of the outstanding principal and accrued interest on the underlying notes.

TDCC’s indenture covenants include obligations to not allow liens on principal U.S. manufacturing facilities, enter into sale and lease-back transactions with respect to principal U.S. manufacturing facilities, merge or consolidate with any other corporation, or sell, lease or convey, directly or indirectly, all or substantially all of TDCC’s assets. The outstanding debt also contains customary default provisions. TDCC remains in compliance with these covenants.

TDCC's primary, private credit agreements also contain certain customary restrictive covenant and default provisions in addition to the covenants set forth above with respect to TDCC's debt. Significant other restrictive covenants and default provisions related to these agreements include:

- (a) the obligation to maintain the ratio of TDCC's consolidated indebtedness to consolidated capitalization at no greater than 0.70 to 1.00 at any time the aggregate outstanding amount of loans under the Five Year Competitive Advance and Revolving Credit Facility Agreement ("Revolving Credit Agreement") dated November 23, 2021, equals or exceeds \$500 million,
- (b) a default if TDCC or an applicable subsidiary fails to make any payment, including principal, premium or interest, under the applicable agreement on other indebtedness of, or guaranteed by, TDCC or such applicable subsidiary in an aggregate amount of \$100 million or more when due, or any other default or other event under the applicable agreement with respect to such indebtedness occurs which permits or results in the acceleration of \$400 million or more in the aggregate of principal, and
- (c) a default if TDCC or any applicable subsidiary fails to discharge or stay within 60 days after the entry of a final judgment against TDCC or such applicable subsidiary of more than \$400 million.

Failure of TDCC to comply with any of the covenants or default provisions could result in a default under the applicable credit agreement which would allow the lenders to not fund future loan requests and to accelerate the due date of the outstanding principal and accrued interest on any outstanding indebtedness.

On April 1, 2019, DowDuPont completed the separation of its materials science business and Dow Inc. became the direct parent company of TDCC. In conjunction with the separation, Dow Inc. is obligated, substantially concurrently with the issuance of any guarantee in respect of outstanding or committed indebtedness under TDCC's Revolving Credit Agreement, to enter into a supplemental indenture with TDCC and the trustee under TDCC's existing 2008 base indenture governing certain notes issued by TDCC. Under such supplemental indenture, Dow Inc. will guarantee all outstanding debt securities and all amounts due under such existing base indenture and will become subject to certain covenants and events of default under the existing base indenture.

In addition, the Revolving Credit Agreement includes an event of default which would be triggered in the event Dow Inc. incurs or guarantees third party indebtedness for borrowed money in excess of \$250 million or engages in any material activity or directly owns any material assets, in each case, subject to certain conditions and exceptions. Dow Inc. may, at its option, cure the event of default by delivering an unconditional and irrevocable guarantee to the administrative agent within thirty days of the event or events giving rise to such event of default.

No such events have occurred or have been triggered at the time of the filing of this Annual Report on Form 10-K.

NOTE 16 – COMMITMENTS AND CONTINGENCIES

Environmental Matters

Introduction

Accruals for environmental matters are recorded when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated based on current law and existing technologies. At December 31, 2021, the Company had accrued obligations of \$1,220 million for probable environmental remediation and restoration costs (\$1,244 million at December 31, 2020), including \$237 million for the remediation of Superfund sites (\$248 million at December 31, 2020). This is management's best estimate of the costs for remediation and restoration with respect to environmental matters for which the Company has accrued liabilities, although it is reasonably possible that the ultimate cost with respect to these particular matters could range up to approximately two times that amount. Consequently, it is reasonably possible that environmental remediation and restoration costs in excess of amounts accrued could have a material impact on the Company's results of operations, financial condition and cash flows. It is the opinion of the Company's management, however, that the possibility is remote that costs in excess of the range disclosed will have a material impact on the Company's results of operations, financial condition or cash flows. Inherent uncertainties exist in these estimates primarily due to unknown conditions, changing governmental regulations and legal standards regarding liability, and emerging remediation technologies for handling site remediation and restoration. As new or additional information becomes available and/or certain spending trends become known, management will evaluate such information in determination of the current estimate of the environmental liability.

As part of the Company's 2020 Restructuring Program, in the third quarter of 2020, the Company recorded a pretax charge related to environmental remediation matters. This charge resulted from the Company's evaluation of the costs required to manage remediation activities at sites Dow will permanently shut down as part of its 2020 Restructuring Program. In addition, the Company recorded indemnification assets of \$50 million related to Dow Silicones' environmental matters. The Company recognized a pretax charge, net of indemnifications, of \$56 million, included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Performance Materials & Coatings (\$52 million) and Corporate (\$4 million). See Note 6 for additional information.

In the third quarter of 2019, the Company recorded a pretax charge related to environmental remediation matters at a number of current and historical locations. The charge primarily resulted from: the culmination of long-standing negotiations and discussions with regulators and agencies, including technical studies supporting higher cost estimates for final or staged remediation plans; the Company's evaluation of the cost required to manage remediation activities at sites affected by Dow's separation from DowDuPont and related agreements with Corteva and DuPont; and, the Company's review of its closure strategies and obligations to monitor ongoing operations and maintenance activities. In addition, the Company recorded indemnification assets of \$48 million related to Dow Silicones' environmental matters. The Company recognized a pretax charge, net of indemnifications, of \$399 million related to these environmental matters, included in "Cost of sales" in the consolidated statements of income and related to Packaging & Specialty Plastics (\$5 million), Industrial Intermediates & Infrastructure (\$8 million), Performance Materials & Coatings (\$50 million) and Corporate (\$336 million).

The following table summarizes the activity in the Company's accrued obligations for environmental matters for the years ended December 31, 2021 and 2020:

Accrued Obligations for Environmental Matters	<i>2021</i>	<i>2020</i>
In millions		
Balance at Jan 1	\$ 1,244	\$ 1,155
Accrual adjustment	159	285
Payments against reserve	(162)	(198)
Foreign currency impact	(21)	2
Balance at Dec 31	\$ 1,220	\$ 1,244

The amounts charged to income on a pretax basis related to environmental remediation totaled \$158 million in 2021, \$234 million in 2020 and \$588 million in 2019. Capital expenditures for environmental protection were \$65 million in 2021, \$80 million in 2020 and \$83 million in 2019.

Midland Off-Site Environmental Matters

On June 12, 2003, the Michigan Department of Environmental Quality ("MDEQ") issued a Hazardous Waste Operating License (the "License") to the Company's Midland, Michigan, manufacturing site (the "Midland Site"), which was renewed and replaced by the MDEQ on September 25, 2015, and included provisions requiring the Company to conduct an investigation to determine the nature and extent of off-site contamination in the City of Midland soils, the Tittabawassee River and Saginaw River sediment and floodplain soils, and the Saginaw Bay, and, if necessary, undertake remedial action. In 2016, final regulatory approval was received from the MDEQ for the City of Midland and the Company is continuing the long term monitoring requirements of the Remedial Action Plan.

Tittabawassee and Saginaw Rivers, Saginaw Bay

The Company, the U.S. Environmental Protection Agency ("EPA") and the State of Michigan ("State") entered into an administrative order on consent ("AOC"), effective January 21, 2010, that requires the Company to conduct a remedial investigation, a feasibility study and a remedial design for the Tittabawassee River, the Saginaw River and the Saginaw Bay, and pay the oversight costs of the EPA and the State under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act. These actions, to be conducted under the lead oversight of the EPA, will build upon the investigative work completed under the State Resource Conservation Recovery Act program from 2005 through 2009.

The Tittabawassee River, beginning at the Midland Site and extending down to the first six miles of the Saginaw River, are designated as the first Operable Unit for purposes of conducting the remedial investigation, feasibility study and remedial design work. This work will be performed in a largely upriver to downriver sequence for eight geographic segments of the Tittabawassee and upper Saginaw Rivers. In the first quarter of 2012, the EPA requested the Company address the Tittabawassee River floodplain ("Floodplain") as an additional segment. In January 2015, the Company and the EPA entered into an order to address remediation of the Floodplain. The remedial work is expected to continue over the next two years as river levels allow. The remainder of the Saginaw River and the Saginaw Bay are designated as a second Operable Unit and the work associated with that unit may also be geographically segmented. The AOC does not obligate the Company to perform removal or remedial action; that action can only be required by a separate order. The Company and the EPA have been negotiating orders separate from the AOC that obligate the Company to perform remedial actions under the scope of work of the AOC. The Company and the EPA have entered into six separate orders to perform limited remedial actions in seven of the eight geographic segments in the first Operable Unit, including the Floodplain. Dow has received from the EPA a Notice of Completion of Work for three of these six orders and the Company continues the long-term monitoring requirements. Dow also has entered into a separate order to perform a limited remedial action for certain properties located within the second Operable Unit.

Alternative Dispute Resolution Process

The Company, the EPA, the U.S. Department of Justice and the natural resource damage trustees (which include the Michigan Office of the Attorney General, the Michigan Department of Environment, Great Lakes and Energy, the Michigan Department of Natural Resources, the U.S. Fish and Wildlife Service, the U.S. Bureau of Indian Affairs and the Saginaw-Chippewa Indian Tribe of Michigan) have been engaged in negotiations to seek to resolve potential governmental claims against the Company for natural resource damages related to historical off-site contamination associated with the City of Midland, the Tittabawassee and Saginaw Rivers and the Saginaw Bay. The Company and the governmental parties started meeting in the fall of 2005 and entered into a Confidentiality Agreement in December 2005.

On July 20, 2020, the U.S. District Court for the Eastern District of Michigan ("District Court") entered a final consent decree in Civil Action No. 1:19-cv-13292 between the Company and federal, state and tribal trustees to resolve allegations of natural resource damages arising from the historic operations of the Company's Midland Site. The consent decree required the Company to pay a \$15 million cash settlement to be used for long-term maintenance and trustee-selected remediation projects with an additional \$7 million to specified local projects managed by third parties. These funds were paid in December 2020. The consent decree further requires the Company to complete 13 additional environmental restoration projects which are valued by the trustees at approximately \$77 million, to be conducted over the next several years. In 2021, the Company, working with the trustees, advanced the design plans for several of the Company required environmental restoration projects with implementation in progress for one of the projects.

At December 31, 2021, the accrual for these off-site matters was \$104 million (included in the total accrued obligation of \$1,220 million). At December 31, 2020, the Company had an accrual for these off-site matters of \$107 million (included in the total accrued obligation of \$1,244 million).

Environmental Matters Summary

It is the opinion of the Company's management that the possibility is remote that costs in excess of those disclosed will have a material impact on the Company's results of operations, financial condition or cash flows.

Litigation

Asbestos-Related Matters of Union Carbide Corporation

Introduction

Union Carbide is and has been involved in a large number of asbestos-related suits filed primarily in state courts during the past four decades. These suits principally allege personal injury resulting from exposure to asbestos-containing products and frequently seek both actual and punitive damages. The alleged claims primarily relate to products that Union Carbide sold in the past, alleged exposure to asbestos-containing products located on Union Carbide's premises and Union Carbide's responsibility for asbestos suits filed against a former Union Carbide subsidiary, Amchem Products, Inc. ("Amchem"). In many cases, plaintiffs are unable to demonstrate that they have suffered any compensable loss as a result of such exposure, or that injuries incurred in fact resulted from exposure to Union Carbide's products. Union Carbide expects more asbestos-related suits to be filed against Union Carbide and Amchem in the future, and will aggressively defend or reasonably resolve, as appropriate, both pending and future claims.

Estimating the Asbestos-Related Liability

Based on a study completed by Ankura Consulting Group, LLC ("Ankura") in January 2003, Union Carbide increased its December 31, 2002, asbestos-related liability for pending and future claims for a 15-year period ending in 2017 to \$2.2 billion, excluding future defense and processing costs. In subsequent years, Union Carbide compared current asbestos claim and resolution activity to the results of the most recent Ankura study at each balance sheet date to determine whether the accrual continued to be appropriate.

In 2016, Ankura completed a study to provide estimates for the undiscounted cost of disposing of pending and future claims against Union Carbide and Amchem through the terminal year of 2049, including a reasonable forecast of future defense and processing costs. Based on the study and Union Carbide's internal review of asbestos claim and resolution activity, Union Carbide determined estimating the liability through the terminal year of 2049 was more appropriate due to increased knowledge and data about the costs to resolve claims and diminished volatility in filing rates. Union Carbide and the Company also determined that estimating and accruing a liability for future asbestos-related defense and processing costs was more appropriate as such costs represent expenditures related to legacy activities that do not contribute to current or future revenue generating activities of Union Carbide and the Company and is also reflective of the manner in which Union Carbide manages its asbestos-related exposure, including careful monitoring of the correlation between defense spending and resolution costs. As a result, in the fourth quarter of 2016, Union Carbide recorded a \$1,113 million increase in its asbestos-related liability for pending and future claims, including future defense and processing costs. Each October, Union Carbide requests Ankura to review its historical asbestos claim and resolution activity through the third quarter of the current year, including asbestos-related defense and processing costs, to determine the appropriateness of updating the most recent study.

In December 2019, Ankura stated that an update of its December 2018 study would not provide a more likely estimate of future events than the estimate reflected in the study and, therefore, the estimate in the study remained applicable. Based on Union Carbide's internal review process and Ankura's response, Union Carbide determined that no change to the accrual was required.

In December 2020, Ankura completed a study of Union Carbide's historical asbestos claim and resolution activity through September 30, 2020, including asbestos-related defense and processing costs, and provided estimates for the undiscounted cost of disposing of pending and future claims against Union Carbide and Amchem through the terminal year of 2049. Based on the study and Union Carbide's internal review process, it was determined that no adjustment to the accrual was required. At December 31, 2020, the asbestos-related liability for pending and future claims against Union Carbide and Amchem, including future asbestos-related defense and processing costs, was \$1,098 million, and approximately 22 percent of the recorded liability related to pending claims and approximately 78 percent related to future claims.

In December 2021, Ankura stated that an update of its December 2020 study would not provide a more likely estimate of future events than the estimate reflected in the study and, therefore, the estimate in the study remained applicable. Based on Union Carbide's internal review process and Ankura's response, Union Carbide determined that no change to the accrual was required. At December 31, 2021, the asbestos-related liability for pending and future claims against Union Carbide and Amchem, including future asbestos-related defense and processing costs, was \$1,016 million, and approximately 25 percent of the recorded liability related to pending claims and approximately 75 percent related to future claims.

Summary

The Company's management believes the amounts recorded by Union Carbide for the asbestos-related liability, including defense and processing costs, reflect reasonable and probable estimates of the liability based upon current, known facts. However, future events, such as the number of new claims to be filed and/or received each year, the average cost of defending and disposing of each such claim, as well as the numerous uncertainties surrounding asbestos litigation in the United States over a significant period of time, could cause the actual costs for Union Carbide to be higher or lower than those projected or those recorded. Any such events could result in an increase or decrease in the recorded liability.

Because of the uncertainties described above, Union Carbide cannot estimate the full range of the cost of resolving pending and future asbestos-related claims facing Union Carbide and Amchem. As a result, it is reasonably possible that an additional cost of disposing of Union Carbide's asbestos-related claims, including future defense and processing costs, could have a material impact on the Company's results of operations and cash flows for a particular period and on the consolidated financial position.

Dow Silicones Chapter 11 Related Matters

Introduction

In 1995, Dow Silicones, then a 50:50 joint venture between the Company and Corning Incorporated ("Corning"), voluntarily filed for protection under Chapter 11 of the U.S. Bankruptcy Code in order to resolve Dow Silicones' breast implant liabilities and related matters (the "Chapter 11 Proceeding"). Dow Silicones emerged from the Chapter 11 Proceeding on June 1, 2004 (the "Effective Date") and is implementing the Joint Plan of Reorganization (the "Plan"). The Plan provides funding for the resolution of breast implant and other product liability litigation covered by the Chapter 11 Proceeding. As of June 1, 2016, Dow Silicones is a wholly owned subsidiary of the Company.

Breast Implant and Other Product Liability Claims

Under the Plan, a product liability settlement program administered by an independent claims office (the "Settlement Facility") was created to resolve breast implant and other product liability claims. Product liability claimants rejecting the settlement program in favor of pursuing litigation must bring suit against a litigation facility (the "Litigation Facility"). Under the Plan, total payments committed by Dow Silicones to resolving product liability claims are capped at a maximum \$2,350 million net present value ("NPV") determined as of the Effective Date using a discount rate of 7 percent (approximately \$4,081 million undiscounted at December 31, 2021). Of this amount, no more than \$400 million NPV determined as of the Effective Date can be used to fund the Litigation Facility.

Dow Silicones had an obligation to fund the Settlement Facility and the Litigation Facility over a 16-year period, commencing at the Effective Date. At December 31, 2021, Dow Silicones and its insurers have made life-to-date payments of \$1,792 million to the Settlement Facility and Dow Silicones is currently making payments to fund the Settlement Facility.

In accordance with ASC Topic 450 "Accounting for Contingencies," the Company records a liability for breast implant and other product liability claims ("Implant Liability"), which reflects the estimated impact of the settlement of pending claims. The claim filing deadline passed in June 2019. All claims have been received and are being processed. Based on the claims filed at and before the deadline, Dow Silicones estimates that it will be obligated to contribute an additional \$130 million to the Settlement Facility at December 31, 2021 (\$160 million at December 31, 2020) which was included in "Accrued and other current liabilities" and "Other noncurrent obligations" in the consolidated balance sheets.

In the third quarter of 2019, with the assistance of a third party consultant ("Consultant"), Dow Silicones updated its Implant Liability estimate, primarily reflecting a decrease in Class 16 claims, a decrease resulting from the passage of time, decreased claim filing activity and administrative costs compared with the previous estimate, and an increase in investment income resulting from insurance proceeds. Based on the Consultant's updated estimate and Dow Silicones own review of claim filing activity, Dow Silicones determined that an adjustment to the Implant Liability was required. Accordingly, in the third quarter of 2019, Dow Silicones decreased its Implant Liability \$98 million and decreased its corresponding Class 16 receivable \$13 million, both included in "Sundry income (expense) - net" in the consolidated statements of income and related to Corporate. The estimate was updated again in the second quarter of 2020 with the assistance of the Consultant, which primarily reflected decreased administrative costs compared with the previous estimate and an increase in investment income resulting from insurance proceeds.

Dow Silicones is not aware of circumstances that would change the factors used in estimating the Implant Liability and believes the recorded liability reflects the best estimate of the remaining funding obligations under the Plan; however, the estimate relies upon a number of significant assumptions, including: future acceptance rates, disease mix, and payment values will be materially consistent with historical experience; no material negative outcomes in future controversies or disputes over Plan interpretation will occur; and the Plan will not be modified. If actual outcomes related to any of these assumptions prove to be materially different, the future liability to fund the Plan may be materially different than the amount estimated.

Commercial Creditor Issues

The Plan provides that each of Dow Silicones commercial creditors (the "Commercial Creditors") would receive in cash the sum of (a) an amount equal to the principal amount of their claims and (b) interest on such claims. Upon the Plan becoming effective, Dow Silicones paid approximately \$1,500 million to the Commercial Creditors, representing principal and an amount of interest that Dow Silicones considers undisputed. On August 19, 2019, Dow Silicones entered into a settlement agreement with the Commercial Creditors related to the remaining disputed portion, obligating Dow Silicones to pay \$172 million, inclusive of the Commercial Creditors' legal costs. The settlement was approved by the District Court. As a result of the settlement agreement, in the third quarter of 2019, the Company recorded a pretax charge of \$50 million, net of indemnifications of \$37 million, included in "Sundry Income (expense) - net" in the consolidated statements of income and related to Corporate. The settlement was paid to the Commercial Creditors in the fourth quarter of 2019. The litigation is now concluded.

Summary

The amounts recorded by Dow Silicones for the Chapter 11 related matters described above were based upon current, known facts, which management believes reflect reasonable and probable estimates of the liability. However, future events could cause the actual costs for Dow Silicones to be higher or lower than those projected or those recorded. Any such events could result in an increase or decrease in the recorded liability.

Other Litigation Matters

In addition to the specific matters described above, the Company is party to a number of other claims and lawsuits arising out of the normal course of business with respect to product liability, patent infringement, employment matters, governmental tax and regulation disputes, contract and commercial litigation, and other actions. Certain of these actions purport to be class actions and seek damages in very large amounts. All such claims are being contested. The Company has an active risk management program consisting of numerous insurance policies secured from many carriers at various times. These policies may provide coverage that could be utilized to minimize the financial impact, if any, of certain contingencies described above. It is the opinion of the Company's management that the possibility is remote that the aggregate of all such other claims and lawsuits will have a material adverse impact on the results of operations, financial condition and cash flows of the Company.

Indemnifications with Corning

In connection with the June 1, 2016 ownership restructure of Dow Silicones, the Company is indemnified by Corning for at least 50 percent of future losses associated with certain pre-closing liabilities, including the Implant Liability, Commercial Creditors issues and certain environmental matters described in the preceding sections, subject to certain conditions and limits. The maximum amount of indemnified losses which may be recovered are subject to a cap that declines over time. Indemnified losses are capped at \$1 billion between May 31, 2018 and May 31, 2023, and no recoveries are permitted after May 31, 2023. The Company had indemnification assets of \$95 million at December 31, 2021 (\$115 million at December 31, 2020), which was included in "Other current assets" and "Noncurrent receivables" in the consolidated balance sheets.

Gain Contingency - Dow v. Nova Chemicals Corporation Patent Infringement Matter

In December 2010, Dow filed suit in the Federal Court in Ontario, Canada ("Federal Court") alleging that Nova Chemicals Corporation ("Nova") was infringing the Company's Canadian polyethylene patent 2,106,705 (the "'705 Patent"). Nova counterclaimed on the grounds of invalidity and non-infringement. In accordance with Canadian practice, the suit was bifurcated into a merits phase, followed by a damages phase. Following trial in the merits phase, in May 2014 the Federal Court ruled that the Company's '705 Patent was valid and infringed by Nova. Nova appealed to the Canadian Federal Court of Appeal, which affirmed the Federal Court decision in August 2016. Nova then sought leave to appeal its loss to the Supreme Court of Canada ("Court"), which dismissed Nova's petition in April 2017. As a result, Nova has exhausted all appeal rights on the merits, and it is undisputed that Nova owes the Company the profits it earned from its infringing sales as determined in the trial for the damages phase.

In April 2017, the Federal Court issued a Public Judgment in the damages phase, which detailed its conclusions on how to calculate the profits to be awarded to the Company. In June 2017, the Federal Court ordered Nova to pay \$645 million Canadian dollars (equivalent to \$495 million U.S. dollars) to the Company, plus pre- and post-judgment interest, for which the Company received payment of \$501 million from Nova in July 2017. Although Nova is appealing portions of the damages judgment, certain portions of it are indisputable and can be retained by the Company regardless of the outcome of any further appeals by Nova. As a result of these actions and in accordance with ASC Topic 450-30 "Gain Contingencies," the Company recorded a \$160 million pretax gain in the second quarter of 2017.

On September 15, 2020, the Canadian Federal Court of Appeal dismissed Nova's appeal of the damages judgment, thus affirming the trial court's decision in its entirety. In November 2020, Nova filed an application for leave to appeal this decision to the Court. In May 2021, the Court granted Nova's application for leave and agreed to review the damages judgment. The Court will hear oral argument on the matter in the first half of 2022 and the Company expects a decision by the end of 2022. The Company is confident of its chances to continue to defend the entire judgment, particularly the trial and appellate courts' determinations on important factual issues, which will be accorded deferential review on appeal. At December 31, 2021, the Company had \$341 million (\$341 million at December 31, 2020) included in "Accrued and other current liabilities" related to the disputed portion of the damages judgment.

Gain Contingency - Dow v. Nova Chemicals Corporation Ethylene Asset Matter

On September 18, 2019, the Court of the Queen's Bench in Alberta, Canada, signed a judgment ordering Nova to pay the Company \$1.43 billion Canadian dollars (equivalent to approximately \$1.08 billion U.S. dollars) by October 11, 2019, for damages the Company incurred through 2012 related to the companies' jointly-owned ethylene asset in Joffre, Alberta, Canada. The Court of the Queen's Bench in Alberta, Canada, which initially ruled in June 2018, found that Nova failed to operate the ethylene asset at full capacity for more than ten years, and furthermore, that Nova violated several contractual agreements related to the Company receiving its share of the asset's ethylene production. These actions resulted in reduced productivity and sales for the Company. Nova has appealed the judgment, however, certain portions of it are not in dispute and are owed to the Company regardless of the outcome of Nova's appeal. As a result of these actions and in accordance with ASC Topic 450-30 "Gain Contingencies," the Company recorded a \$186 million pretax gain in the third quarter of 2019, of which \$170 million was included in "Sundry income (expense) - net" and \$16 million was included in "Selling, general and administrative expenses" in the consolidated statements of income and related to Packaging & Specialty Plastics. In October 2019, Nova paid \$1.08 billion Canadian dollars (equivalent to approximately \$0.8 billion U.S. dollars) directly to the Company, and remitted \$347 million Canadian dollars to the Canada Revenue Agency ("CRA") for the tax account of one of the Company's subsidiaries. The Company sought a refund of the entire amount remitted to CRA. On March 31, 2020, the Company received the full refund from CRA, equivalent to \$259 million U.S. dollars.

In preparation for the June 2020 appellate hearing on the case, Nova provided the Court of the Queen's Bench in Alberta, Canada, an updated schedule of the financial impact of the issues on appeal, which explained that even if Nova prevails on all appeal issues, the Company would still be entitled to retain an amount in excess of the gain recognized in 2019. As a result, the Company recorded an \$18 million pretax gain in the second quarter of 2020, of which \$12 million was included in "Selling, general and administrative expenses" and \$6 million was included in "Sundry income (expense) - net" in the consolidated statements of income and related to Packaging & Specialty Plastics. On September 16, 2020, the Court of Appeal of Alberta issued its decision, affirming the trial court's liability finding, upholding the majority of Dow's damages and requiring the trial court to recalculate a portion of damages. In the fourth quarter of 2020, Nova chose not to petition the Court to review the appellate court decision, making additional portions of the ruling in Dow's favor final and no longer subject to dispute. As a result, the Company recorded a \$552 million pretax gain in the fourth quarter of 2020, of which \$538 million was included in "Sundry income (expense) - net" and \$14 million was included in "Selling, general and administrative expenses" in the consolidated statements of income and related to Packaging & Specialty Plastics. At December 31, 2021, \$323 million (\$323 million at December 31, 2020) was included in "Other noncurrent obligations" in the Company's consolidated balance sheets related to the disputed portion of the damages judgment. Dow continues to seek an award of additional damages for the period from 2013 through 2018. The damages hearing began in the trial court in November 2021 that would resolve the impact of the appellate ruling and quantify Dow's damages for the 2013-2018 period.

Luxi Chemical Group Breach of Contract Matter

In November 2017, an arbitration panel of the Stockholm Chamber of Commerce held that Luxi Chemical Group Co., Ltd. ("Luxi"), based in Shandong Province, China, violated a secrecy and non-use agreement related to the Dow and Johnson Matthey Davy Technologies Limited ("JM") LP OxoSM Process by using Dow and JM protected information in the design, construction, and operation of its butanol and 2-ethylhexanol plants, awarding damages, fees and costs, plus interest, to both Dow and JM. In September 2021, Luxi paid the arbitration award and interest assessment and, as a result, Dow recorded a pretax gain of \$54 million included in "Sundry income (expense) - net" in the consolidated statements of income and related to Industrial Intermediates & Infrastructure.

Brazilian Tax Credits

In March 2017, the Federal Supreme Court of Brazil (“Brazil Supreme Court”) ruled in a leading case that a Brazilian value-added tax (“ICMS”) should not be included in the base used to calculate a taxpayer’s federal contribution on total revenue known as PIS/COFINS (the “2017 Decision”). Previously, three of the Company’s Brazilian subsidiaries filed lawsuits challenging the inclusion of ICMS in their calculation of PIS/COFINS, seeking recovery of excess taxes paid. In response to the 2017 Decision, the Brazilian tax authority filed an appeal seeking clarification of the amount of ICMS tax to exclude from the calculation of PIS/COFINS. In May 2021, the Brazil Supreme Court ruled in a leading case related to the amount of ICMS tax to exclude from the calculation of PIS/COFINS, which resolved two of the lawsuits filed by the Company. As a result, in 2021, the Company recorded a pretax gain of \$67 million for certain excess PIS/COFINS paid from 2009 to 2019, plus applicable interest, which the Company expects to apply to future required federal tax payments, and the reversal of related liabilities. The pretax gain was recorded in “Cost of sales” in the consolidated statements of income. At December 31, 2021, related tax credits available and expected to be applied to future required federal tax payments totaled \$52 million. The Company has not received a final ruling related to its remaining lawsuit.

Purchase Commitments

The Company has outstanding purchase commitments and various commitments for take-or-pay or throughput agreements. The Company was not aware of any purchase commitments that were negotiated as part of a financing arrangement for the facilities that will provide the contracted goods or services or for the costs related to those goods or services at December 31, 2021 and 2020.

Guarantees

The following table provides a summary of the final expiration, maximum future payments and recorded liability reflected in the consolidated balance sheets for guarantees:

Guarantees	Dec 31, 2021			Dec 31, 2020		
	Final Expiration	Maximum Future Payments ¹	Recorded Liability	Final Expiration	Maximum Future Payments	Recorded Liability
In millions						
Guarantees	2038	\$ 1,273	\$ 220	2023	\$ 251	\$ 2

1. In addition, TDCC has provided guarantees, in proportion to the Company’s 35 percent ownership interest, of all future interest payments that will become due on Sadara’s project financing debt during the grace period, which Dow’s share is estimated to be \$446 million at December 31, 2021. Based on Sadara’s current forecasted cash flows, the Company does not expect to be required to perform under the guarantees.

Guarantees arise during the ordinary course of business from relationships with customers, committed accounts receivable facilities and nonconsolidated affiliates when the Company undertakes an obligation to guarantee the performance of others (via delivery of cash or other assets) if specified triggering events occur. With guarantees, such as commercial or financial contracts, non-performance by the guaranteed party triggers the obligation of the Company to make payments to the beneficiary of the guarantee. The majority of the Company’s guarantees relate to debt of nonconsolidated affiliates, which have expiration dates ranging from less than one year to less than 17 years. The Company’s current expectation is that future payment or performance related to the non-performance of others is considered remote.

TDCC has entered into guarantee agreements related to Sadara, a nonconsolidated affiliate. The total of an Islamic bond and additional project financing (collectively “Total Project Financing”) obtained by Sadara was approximately \$12.5 billion, of which \$9.6 billion of Total Project Financing debt was outstanding at December 31, 2021 (\$9.9 billion at December 31, 2020). In November 2020, the remaining project completion conditions related to the Total Project Financing guarantees were fulfilled and the Company’s guarantee obligations terminated. Subsequently, the Company provided a new guarantee in the form of a letter of credit for its share of one future debt service schedule payment up to \$220 million. The guarantee was in proportion to the Company’s 35 percent ownership interest in Sadara and was in effect until Sadara reached an agreement with its lenders to re-profile its outstanding project financing debt in the first quarter of 2021, at which time it was cancelled. In conjunction with the completion of Sadara’s debt re-profiling, TDCC entered into a new guarantee of up to approximately \$1.3 billion of Sadara’s debt, proportionate to the Company’s 35 percent ownership interest. The debt re-profiling includes a grace period until June 2026, during which Sadara is obligated to make interest-only payments which are guaranteed by TDCC in proportion to the Company’s 35 percent ownership interest. In addition, as part of the debt re-profiling, Sadara established a new \$500 million revolving credit facility guaranteed by Dow, which will be used to fund Dow’s pro-rata share of any potential shortfall during the grace period. Based on Sadara’s current forecasted cash flows,

the Company does not expect Sadara to draw on the facility. As a result of these actions, TDCC does not expect to provide any shareholder loans or equity contributions to Sadara in 2022. See Note 12 for additional information.

Asset Retirement Obligations

The Company has 104 manufacturing sites in 31 countries. Most of these sites contain numerous individual manufacturing operations, particularly at the Company's larger sites. Asset retirement obligations are recorded as incurred and reasonably estimable, including obligations for which the timing and/or method of settlement are conditional on a future event that may or may not be within the control of the Company. The retirement of assets may involve such efforts as remediation and treatment of asbestos, contractually required demolition, and other related activities, depending on the nature and location of the assets; and retirement obligations are typically realized only upon demolition of those facilities. In identifying asset retirement obligations, the Company considers identification of legally enforceable obligations, changes in existing law, estimates of potential settlement dates and the calculation of an appropriate discount rate to be used in calculating the fair value of the obligations. The Company has a well-established global process to identify, approve and track the demolition of retired or to-be-retired facilities; and no assets are retired from service until this process has been followed. The Company typically forecasts demolition projects based on the usefulness of the assets; environmental, health and safety concerns; and other similar considerations. Under this process, as demolition projects are identified and approved, reasonable estimates are determined for the time frames during which any related asset retirement obligations are expected to be settled. For those assets where a range of potential settlement dates may be reasonably estimated, obligations are recorded. The Company routinely reviews all changes to items under consideration for demolition to determine if an adjustment to the value of the asset retirement obligation is required.

The Company has recognized asset retirement obligations for the following activities: demolition and remediation activities at manufacturing sites primarily in Europe, Canada, United States, Japan, United Arab Emirates and Brazil; and capping activities at landfill sites in the United States, Brazil and Canada. The Company has also recognized conditional asset retirement obligations related to asbestos encapsulation as a result of planned demolition and remediation activities at manufacturing and administrative sites primarily in the United States, Europe, Japan and Argentina. The aggregate carrying amount of conditional asset retirement obligations recognized by the Company (included in the asset retirement obligations balance shown below) was \$13 million at December 31, 2021 (\$14 million at December 31, 2020).

The following table shows changes in the aggregate carrying amount of the Company's asset retirement obligations for the years ended December 31, 2021 and 2020:

Asset Retirement Obligations		
In millions	2021	2020
Balance at Jan 1	\$ 112	\$ 104
Additional accruals	13	6
Liabilities settled	(7)	(3)
Accretion expense	1	3
Revisions in estimated cash flows	(1)	7
Other	—	(5)
Balance at Dec 31	\$ 118	\$ 112

The discount rate used to calculate the Company's asset retirement obligations at December 31, 2021, was 1.13 percent (0.42 percent at December 31, 2020). These obligations are included in the consolidated balance sheets as "Accrued and other current liabilities" and "Other noncurrent obligations."

The Company has not recognized conditional asset retirement obligations for which a fair value cannot be reasonably estimated in its consolidated financial statements. Assets that have not been submitted/reviewed for potential demolition activities are considered to have continued usefulness and are generally still operating normally. Therefore, without a plan to demolish the assets or the expectation of a plan, such as shortening the useful life of assets for depreciation purposes in accordance with the accounting guidance related to property, plant and equipment, the Company is unable to reasonably forecast a time frame to use for present value calculations. As such, the Company has not recognized obligations for individual plants/buildings at its manufacturing sites where estimates of potential settlement dates cannot be reasonably made. In addition, the Company has not recognized conditional asset retirement obligations for the capping of its approximately 36 underground storage wells and 128 underground brine mining and other wells at Company-owned sites when there are no plans or expectations of plans to exit the sites. It is the opinion of the Company's management that the possibility is remote that such conditional asset retirement obligations, when estimable, will have a material impact on the Company's consolidated financial statements based on current costs.

NOTE 17 - LEASES

Operating lease ROU assets are included in "Operating lease right-of-use assets" while finance lease ROU assets are included in "Net property" in the consolidated balance sheets. With respect to lease liabilities, operating lease liabilities are included in "Operating lease liabilities - current" and "Operating lease liabilities - noncurrent," and finance lease liabilities are included in "Long-term debt due within one year" and "Long-Term Debt" in the consolidated balance sheets.

Dow routinely leases sales and administrative offices, power plants, production facilities, warehouses and tanks for product storage, aircraft, motor vehicles, railcars, computers, office machines and equipment. Some leases contain renewal provisions, purchase options and escalation clauses and the terms for these leased assets vary depending on the lease agreement. These leased assets have remaining lease terms of up to 54 years. See Note 1 for additional information on leases.

The components of lease cost for operating and finance leases for the years ended December 31, 2021, 2020 and 2019 were as follows:

Lease Cost			
In millions	2021	2020	2019
Operating lease cost	\$ 494	\$ 484	\$ 532
Finance lease cost			
Amortization of right-of-use assets - finance	76	58	39
Interest on lease liabilities - finance	27	25	25
Total finance lease cost	103	83	64
Short-term lease cost	238	213	204
Variable lease cost	381	199	198
Sublease income	(6)	(5)	(4)
Total lease cost	\$ 1,210	\$ 974	\$ 994

The following table provides supplemental cash flow and other information related to leases:

Other Lease Information	2021	2020	2019
In millions			
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash flows for operating leases	\$ 497	\$ 482	\$ 544
Operating cash flows for finance leases	\$ 27	\$ 25	\$ 25
Financing cash flows for finance leases	\$ 74	\$ 58	\$ 34
Right-of-use assets obtained in exchange for lease obligations:			
Operating leases ^{1,2}	\$ (25)	\$ 185	\$ 2,476
Finance leases ¹	\$ 512	\$ 178	\$ 89

1. In 2021, \$193 million of leased assets were reclassified from Operating leases to Finance leases due to an amendment that extended the term of the agreement.

2. 2019 includes \$2.3 billion related to the adoption of Topic 842. See Note 1 for additional information.

The following table summarizes the lease-related assets and liabilities recorded in the consolidated balance sheets at December 31, 2021 and 2020.

Lease Position	<i>Balance Sheet Classification</i>	Dec 31, 2021	Dec 31, 2020
In millions			
Assets			
Operating lease assets	Operating lease right-of-use assets	\$ 1,412	\$ 1,856
Finance lease assets	Property	1,158	665
Finance lease amortization	Accumulated depreciation	(368)	(216)
Total lease assets		\$ 2,202	\$ 2,305
Liabilities			
Current			
Operating	Operating lease liabilities - current	\$ 314	\$ 416
Finance	Long-term debt due within one year	106	54
Noncurrent			
Operating	Operating lease liabilities - noncurrent	1,149	1,521
Finance	Long-Term Debt	763	464
Total lease liabilities		\$ 2,332	\$ 2,455

In 2021, the Company executed buy-outs of certain leased assets for \$687 million. The lease buy-outs reduced "Operating lease right-of-use assets" by \$166 million and reduced "Operating lease liabilities - current" and "Operating lease liabilities - noncurrent" by \$44 million and \$158 million, respectively. The Company recognized a pretax loss related to the lease buy-outs of \$37 million included in "Sundry income (expense) - net" in the consolidated statements of income. The lease buy-outs are included in "Purchases of previously leased assets" in the consolidated statements of cash flows.

Additionally, in 2021, the Company amended an agreement to extend leases of certain assets. The amendment and related remeasurement resulted in a reclassification of \$73 million from "Operating lease liabilities - noncurrent" to "Long-Term Debt" and \$34 million from "Operating lease liabilities - current" to "Long-term debt due within one year." In addition to the reclassifications, the amendment increased "Long-Term Debt" by \$152 million and decreased "Long-term debt due within one year" by \$2 million.

The weighted-average remaining lease term and discount rate for leases recorded in the consolidated balance sheets at December 31, 2021 and 2020 are provided below:

Lease Term and Discount Rate	<i>Dec 31, 2021</i>	<i>Dec 31, 2020</i>
Weighted-average remaining lease term		
Operating leases	7.9 years	7.6 years
Finance leases	11.8 years	11.6 years
Weighted-average discount rate		
Operating leases	3.72 %	3.84 %
Finance leases	4.17 %	5.41 %

The following table provides the maturities of lease liabilities at December 31, 2021:

Maturities of Lease Liabilities	<i>Operating Leases</i>	<i>Finance Leases</i>
In millions		
2022	\$ 346	\$ 137
2023	281	162
2024	218	103
2025	181	74
2026	145	69
2027 and thereafter	570	551
Total future undiscounted lease payments	\$ 1,741	\$ 1,096
Less: Imputed interest	278	227
Total present value of lease liabilities	\$ 1,463	\$ 869

At December 31, 2021, Dow had additional leases of approximately \$113 million, primarily for equipment, which had not yet commenced. These leases are expected to commence in 2022 and 2025, with lease terms of up to 16 years.

Dow provides guarantees related to certain leased assets, specifying the residual value that will be available to the lessor at lease termination through the sale of the assets to the lessee or third parties. The following table provides a summary of the final expiration, maximum future payments and recorded liability reflected in the consolidated balance sheets for residual value guarantees at December 31, 2021 and 2020. The lease agreements do not contain any material restrictive covenants.

Lease Guarantees	<i>Dec 31, 2021</i>			<i>Dec 31, 2020</i>		
	<i>Final Expiration</i>	<i>Maximum Future Payments</i>	<i>Recorded Liability</i>	<i>Final Expiration</i>	<i>Maximum Future Payments</i>	<i>Recorded Liability</i>
In millions						
Residual value guarantees	2031	\$ 280	\$ —	2030	\$ 818	\$ 22

NOTE 18 – STOCKHOLDERS' EQUITY

Common Stock

Dow Inc.

Dow Inc. was incorporated in 2018 with 100 authorized and issued shares of common stock, par value \$0.01 per share, owned solely by its parent company, DowDuPont. In the first quarter of 2019, in connection with the separation and distribution of DowDuPont's materials science business, the number of authorized shares of common stock was increased to 5,000,000,000 shares, par value \$0.01 per share, and Dow Inc.'s 100 shares of issued common stock were recapitalized into 748,771,240 shares of common stock. Dow Inc.'s common stock was solely owned by DowDuPont through March 31, 2019, and on April 1, 2019, Dow Inc. became an independent, publicly traded company. Dow Inc. common stock is listed on the NYSE under the symbol "DOW." See Note 3 for additional information.

The Company may issue shares of Dow Inc. common stock out of treasury stock or as new shares of common stock for options exercised and for the release of restricted stock units ("RSUs"), performance stock units ("PSUs") and the Employee Stock Purchase Plan ("ESPP") program. Common stock shares issued to employees and non-employee directors was approximately 8.2 million in 2021 (4.8 million in 2020). Subsequent to the separation from DowDuPont, the number of new Dow Inc. common stock shares issued to employees and non-employee directors was approximately 2.5 million in 2019. See Note 21 for additional information on the Company's equity awards.

TDCC

Effective with the Merger and through March 31, 2019, TDCC had 100 authorized and issued shares of common stock, par value \$0.01 per share, owned solely by DowDuPont. Effective with the separation from DowDuPont, TDCC became a wholly owned subsidiary of Dow Inc., which now holds all 100 authorized and issued shares of common stock of TDCC. See Note 3 for additional information.

Retained Earnings

Dow Inc.

There are no significant restrictions limiting Dow Inc.'s ability to pay dividends. Dow Inc. declared dividends of \$2.80 per share in 2021 (\$2.80 per share in 2020 and \$2.10 per share in 2019, subsequent to the separation from DowDuPont).

Undistributed earnings of nonconsolidated affiliates included in retained earnings were \$1,155 million at December 31, 2021 and \$716 million at December 31, 2020.

TDCC

Effective with the Merger, TDCC no longer had publicly traded common stock. TDCC's common shares were owned solely by DowDuPont, prior to the separation on April 1, 2019, and TDCC's Board determined whether or not there would be a dividend distribution to DowDuPont. Effective with the separation from DowDuPont on April 1, 2019, TDCC became a wholly owned subsidiary of Dow Inc. and TDCC's Board determines whether or not there will be a dividend distribution to Dow Inc. TDCC declared and paid dividends to Dow Inc. of \$3,264 million in 2021, \$2,233 million in 2020 and \$201 million in 2019. In 2019, TDCC declared and paid dividends to DowDuPont of \$535 million.

Employee Stock Ownership Plan

The Dow Employee Stock Ownership Plan (the "ESOP") is an integral part of The Dow Chemical Company Employees' Savings Plan (the "Savings Plan"). A significant majority of full-time employees in the United States are eligible to participate in the Savings Plan. The Company uses the ESOP to provide its matching contribution in the form of stock to Plan participants. Effective with the Merger, shares of TDCC Common Stock held by the ESOP were converted into shares of DowDuPont Common Stock at a ratio of 1:1. Effective with the separation from DowDuPont, the DowDuPont Common Stock held by the ESOP received a Dow Inc. Common Stock share dividend at a ratio of 3:1, resulting in the ESOP holding both DowDuPont and Dow Inc. shares. Subsequent to the separation from DowDuPont, the ESOP independent fiduciary sold the DowDuPont shares and purchased additional Dow Inc. shares with the proceeds.

In connection with the acquisition of Rohm and Haas on April 1, 2009, the Rohm and Haas Employee Stock Ownership Plan (the "Rohm and Haas ESOP") was merged into the Savings Plan, and the Company assumed the \$78 million balance of debt at 9.8 percent interest with final maturity in 2020 that was used to finance share purchases by the Rohm and Haas ESOP in 1990. The debt was fully repaid in 2020 which resulted in an outstanding balance of zero at December 31, 2020.

Dividends on unallocated shares held by the ESOP are used by the ESOP to make debt service payments and to purchase additional shares if dividends exceed the debt service payments. Dividends on allocated shares are used by the ESOP to make debt service payments to the extent needed; otherwise, they are paid to the Savings Plan participants. Shares are released for allocation to participants based on the ratio of the current year's debt service to the sum of the principal and interest payments over the life of the loan. The shares are allocated to Plan participants in accordance with the terms of the Savings Plan. The unallocated shares are excluded from the Company's earnings per share calculation.

Compensation expense for allocated shares is recorded at the fair value of the shares on the date of allocation. Compensation expense reflected in income from continuing operations for ESOP shares was \$77 million in 2021, \$72 million in 2020 and \$77 million in 2019. At December 31, 2021, 4.0 million shares out of a total 4.5 million shares held by the ESOP had been allocated to participants' accounts and 0.5 million shares, at a fair value of \$29 million, were considered unearned.

Treasury Stock

Dow Inc.

On April 1, 2019, Dow Inc.'s Board ratified the share repurchase program originally approved on March 15, 2019, authorizing up to \$3.0 billion to be spent on the repurchase of the Company's common stock, with no expiration date. In 2021, Dow Inc. repurchased \$1.0 billion of Dow Inc. common stock (\$125 million in 2020 and \$500 million in 2019). At December 31, 2021, \$1.4 billion of the share repurchase program authorization remained available for repurchases.

The Company may issue shares of Dow Inc. common stock out of treasury stock or as new shares of common stock for options exercised and for the release of RSUs, PSUs and ESPP. The Company did not issue any treasury shares to employees and non-employee directors under its stock-based compensation programs for the years ended December 31, 2021, 2020 and 2019. See Note 21 for additional information on changes to the Company's equity awards in connection with the separation from DowDuPont.

The following table provides a reconciliation of Dow Inc. common stock activity for the years ended December 31, 2021, 2020 and 2019:

Shares of Dow Inc. Common Stock	<i>Issued</i>	<i>Held in Treasury</i>
Balance at Jan 1, 2019	100	—
Impact of recapitalization	748,771,140	—
Issued ¹	2,457,404	—
Repurchased	—	9,729,834
Balance at Jan 1, 2020	751,228,644	9,729,834
Issued ¹	4,764,554	—
Repurchased	—	3,073,469
Balance at Jan 1, 2021	755,993,198	12,803,303
Issued ¹	8,233,684	—
Repurchased	—	16,208,270
Balance at Dec 31, 2021	764,226,882	29,011,573

1. Shares issued to employees and non-employee directors under the Company's equity compensation plans.

Accumulated Other Comprehensive Loss

The changes in each component of AOCL for the years ended December 31, 2021, 2020 and 2019 were as follows:

Accumulated Other Comprehensive Loss			
In millions	2021	2020	2019
Unrealized Gains (Losses) on Investments			
Beginning balance	\$ 104	\$ 64	\$ (51)
Unrealized gains (losses) on investments	(21)	104	178
Tax (expense) benefit	5	(23)	(38)
Net unrealized gains (losses) on investments	(16)	81	140
(Gains) losses reclassified from AOCL to net income ¹	(38)	(54)	(33)
Tax expense (benefit) ²	9	13	8
Net (gains) losses reclassified from AOCL to net income	(29)	(41)	(25)
Other comprehensive income (loss), net of tax	(45)	40	115
Ending balance	\$ 59	\$ 104	\$ 64
Cumulative Translation Adjustment			
Beginning balance	\$ (930)	\$ (1,135)	\$ (1,813)
Gains (losses) on foreign currency translation	(375)	227	59
Tax (expense) benefit	(40)	25	(2)
Net gains (losses) on foreign currency translation	(415)	252	57
(Gains) losses reclassified from AOCL to net income ³	(10)	(47)	(89)
Other comprehensive income (loss), net of tax	(425)	205	(32)
Impact of common control transaction ⁴	—	—	710
Ending balance	\$ (1,355)	\$ (930)	\$ (1,135)
Pension and Other Postretirement Benefits			
Beginning balance	\$ (9,559)	\$ (8,781)	\$ (7,965)
Gains (losses) arising during the period	2,094	(1,769)	(1,699)
Tax (expense) benefit	(464)	411	413
Net gains (losses) arising during the period	1,630	(1,358)	(1,286)
Amortization of net loss and prior service credits reclassified from AOCL to net income ⁵	776	753	504
Tax expense (benefit) ²	(181)	(173)	(117)
Net loss and prior service credits reclassified from AOCL to net income	595	580	387
Other comprehensive income (loss), net of tax	2,225	(778)	(899)
Impact of common control transaction ⁴	—	—	83
Ending balance	\$ (7,334)	\$ (9,559)	\$ (8,781)
Derivative Instruments			
Beginning balance	\$ (470)	\$ (394)	\$ (56)
Gains (losses) on derivative instruments	155	(96)	(470)
Tax (expense) benefit	3	(1)	101
Net gains (losses) on derivative instruments	158	(97)	(369)
(Gains) losses reclassified from AOCL to net income ⁶	(38)	30	44
Tax expense (benefit) ²	3	(9)	(13)
Net (gains) losses reclassified from AOCL to net income	(35)	21	31
Other comprehensive income (loss), net of tax	123	(76)	(338)
Ending balance	\$ (347)	\$ (470)	\$ (394)
Total AOCL ending balance	\$ (8,977)	\$ (10,855)	\$ (10,246)

1. Reclassified to "Net sales" and "Sundry income (expense) - net."

2. Reclassified to "Provision for income taxes on continuing operations."

3. Reclassified to "Sundry income (expense) - net."

4. Reclassified to "Retained earnings" as a result of the separation from DowDuPont on April 1, 2019. See Note 3 for additional information.

5. These AOCL components are included in the computation of net periodic benefit cost of the Company's defined benefit pension and other postretirement benefit plans. See Note 20 for additional information.

6. Reclassified to "Cost of sales," "Sundry income (expense) - net" and "Interest expense and amortization of debt discount."

NOTE 19 – NONCONTROLLING INTERESTS

Ownership interests in the Company's subsidiaries held by parties other than the Company are presented separately from the Company's equity in the consolidated balance sheets as "Noncontrolling interests." The amount of consolidated net income attributable to the Company and the noncontrolling interests are both presented on the face of the consolidated statements of income.

The following table summarizes the activity for equity attributable to noncontrolling interests for the years ended December 31, 2021, 2020 and 2019:

Noncontrolling Interests			
In millions	2021	2020	2019
Balance at Jan 1	\$ 570	\$ 553	\$ 1,138
Net income attributable to noncontrolling interests - continuing operations	94	69	74
Net income attributable to noncontrolling interests - discontinued operations	—	—	13
Distributions to noncontrolling interests ¹	(66)	(55)	(77)
Impact of common control transaction ²	—	—	(353)
Purchase of noncontrolling interests ³	—	—	(254)
Deconsolidation of noncontrolling interests ⁴	—	(7)	—
Cumulative translation adjustments	(25)	9	12
Other	1	1	—
Balance at Dec 31	\$ 574	\$ 570	\$ 553

1. Distributions to noncontrolling interests are net of \$7 million in 2021 (\$7 million in 2020 and 2019) in dividends paid to a joint venture, which were reclassified to "Equity in earnings (losses) of nonconsolidated affiliates" in the consolidated statements of income. Also includes amounts attributable to discontinued operations of \$7 million in 2019.

2. Related to the separation from DowDuPont. See Note 3 for additional information.

3. Related to the acquisition of full ownership in a propylene oxide manufacturing joint venture, which occurred on October 1, 2019. See Note 24 for additional information. As a result of this arrangement, the carrying value of the noncontrolling interest was removed, and "Additional paid-in capital" was adjusted by \$38 million.

4. Related to the divestiture of the Company's interest in a cogeneration facility in Brazil in the third quarter of 2020.

NOTE 20 – PENSION PLANS AND OTHER POSTRETIREMENT BENEFITS

Defined Benefit Pension Plans

The Company has both funded and unfunded defined benefit pension plans that cover employees in the United States and a number of other countries. The U.S. tax-qualified plan covering the parent company is the largest plan. Benefits for employees hired before January 1, 2008, are based on length of service and the employee's three highest consecutive years of compensation. Employees hired after January 1, 2008, earn benefits that are based on a set percentage of annual pay, plus interest.

On March 4, 2021, the Company announced changes to its U.S. tax-qualified and non-qualified pension plans. Effective December 31, 2023 ("Effective Date"), the Company will freeze the pensionable compensation and credited service amounts used to calculate pension benefits for employees who participate in its U.S. tax-qualified and non-qualified retirement programs (collectively, the "U.S. Plans"). As a result, at the Effective Date and subject to any bargaining obligations required by law, active participants of the U.S. Plans will not accrue additional benefits for future service and compensation. In connection with these plan amendments, the Company remeasured its U.S. Plans effective February 28, 2021, which resulted in a pretax actuarial gain of \$1,268 million, included in other comprehensive income and inclusive of a \$345 million reduction in the projected benefit obligation resulting from the plan amendments, and a pretax curtailment gain of \$19 million, recognized in the first quarter of 2021.

The Company's funding policy is to contribute to the plans when pension laws and/or economics either require or encourage funding. On March 4, 2021, the Company elected to contribute \$1 billion to its U.S. tax-qualified pension plans. Total global pension contributions were \$1,219 million in 2021, which includes contributions necessary to fund benefit payments for the Company's unfunded pension plans. The Company expects to contribute approximately \$180 million to its pension plans in 2022.

The weighted-average assumptions used to determine pension plan obligations and net periodic benefit costs for all plans are summarized in the table below:

Weighted-Average Assumptions for All Pension Plans	<i>Benefit Obligations at Dec 31</i>		<i>Net Periodic Benefit Costs for the Year Ended</i>		
	<i>2021</i>	<i>2020</i>	<i>2021</i>	<i>2020</i>	<i>2019</i>
Discount rate	2.57 %	2.20 %	2.40 %	2.81 %	3.50 %
Interest crediting rate for applicable benefits	3.57 %	3.55 %	3.55 %	3.51 %	3.72 %
Rate of compensation increase	3.94 %	3.91 %	3.91 %	3.92 %	3.92 %
Expected return on plan assets			6.86 %	7.00 %	7.11 %

The weighted-average assumptions used to determine pension plan obligations and net periodic benefit costs for U.S. plans are summarized in the table below:

Weighted-Average Assumptions for U.S. Pension Plans	<i>Benefit Obligations at Dec 31</i>		<i>Net Periodic Benefit Costs for the Year Ended</i>		
	<i>2021</i>	<i>2020</i>	<i>2021</i>	<i>2020</i>	<i>2019</i>
Discount rate	3.04 %	2.71 %	3.03 %	3.41 %	4.15 %
Interest crediting rate for applicable benefits	4.50 %	4.50 %	4.50 %	4.50 %	4.50 %
Rate of compensation increase	4.25 %	4.25 %	4.25 %	4.25 %	4.25 %
Expected return on plan assets			7.96 %	7.95 %	7.92 %

Other Postretirement Benefit Plans

The Company provides certain health care and life insurance benefits to retired employees and survivors. The Company's plans outside of the United States are not significant; therefore, this discussion relates to the U.S. plans only. The plans provide health care benefits, including hospital, physicians' services, drug and major medical expense coverage, and life insurance benefits. In general, for employees hired before January 1, 1993, the plans provide benefits supplemental to Medicare when retirees are eligible for these benefits. The Company and the retiree share the cost of these benefits, with the Company portion increasing as the retiree has increased years of credited service, although there is a cap on the Company portion. The Company has the ability to change these benefits at any time. Employees hired after January 1, 2008, are not covered under the plans.

The Company funds most of the cost of these health care and life insurance benefits as incurred. In 2021, the Company did not make any contributions to its other postretirement benefit plan trusts. The trusts did not hold assets at December 31, 2021. The Company does not expect to contribute assets to its other postretirement benefit plan trusts in 2022.

The weighted-average assumptions used to determine other postretirement benefit plan obligations and net periodic benefit costs for the U.S. plans are provided below:

Weighted-Average Assumptions for U.S. Other Postretirement Benefits Plans	<i>Benefit Obligations at Dec 31</i>		<i>Net Periodic Benefit Costs for the Year Ended</i>		
	<i>2021</i>	<i>2020</i>	<i>2021</i>	<i>2020</i>	<i>2019</i>
Discount rate	2.85 %	2.38 %	2.38 %	3.19 %	4.01 %
Health care cost trend rate assumed for next year	6.50 %	6.75 %	6.75 %	6.25 %	6.50 %
Rate to which the cost trend rate is assumed to decline (the ultimate health care cost trend rate)	5.00 %	5.00 %	5.00 %	5.00 %	5.00 %
Year that the rate reaches the ultimate health care cost trend rate	2028	2028	2028	2025	2025

Assumptions

The Company determines the expected long-term rate of return on plan assets by performing a detailed analysis of key economic and market factors driving historical returns for each asset class and formulating a projected return based on factors in the current environment. Factors considered include, but are not limited to, inflation, real economic growth, interest rate yield, interest rate spreads and other valuation measures and market metrics. The expected long-term rate of return for each asset class is then weighted based on the strategic asset allocation approved by the governing body for each plan. The Company's historical experience with the pension fund asset performance is also considered.

The Company uses the spot rate approach to determine the discount rate utilized to measure the service cost and interest cost components of net periodic pension and other postretirement benefit costs for the U.S. and other selected countries. Under the spot rate approach, the Company calculates service cost and interest cost by applying individual spot rates from the Willis Towers Watson RATE:Link yield curve (based on high-quality corporate bond yields) for each selected country to the separate expected cash flow components of service cost and interest cost. Service cost and interest cost for all other plans are determined on the basis of the single equivalent discount rates derived in determining those plan obligations.

The discount rates utilized to measure the pension and other postretirement obligations of the U.S. plans are based on the yield on high-quality corporate fixed income investments at the measurement date. Future expected actuarially determined cash flows for the Company's U.S. plans are individually discounted at the spot rates under the Willis Towers Watson U.S. RATE:Link 60-90 corporate yield curve (based on 60th to 90th percentile high-quality corporate bond yields) to arrive at the plan's obligations as of the measurement date.

The Company's mortality assumption used for the US plans is a benefit-weighted version of the Society of Actuaries' RP-2014 base table with future rates of mortality improvement based on a modified version of the assumptions used in the Social Security Administration's 2021 trustees report.

Summarized information on the Company's pension and other postretirement benefit plans is as follows:

Change in Projected Benefit Obligations, Plan Assets and Funded Status of All Significant Plans In millions	Defined Benefit Pension Plans		Other Postretirement Benefit Plans	
	2021	2020	2021	2020
<i>Change in projected benefit obligations:</i>				
Benefit obligations at beginning of year	\$ 35,309	\$ 32,621	\$ 1,464	\$ 1,535
Service cost	387	399	7	7
Interest cost	594	767	23	40
Plan participants' contributions	10	12	—	—
Actuarial changes in assumptions and experience	(820)	3,021	(98)	7
Benefits paid	(1,582)	(1,569)	(141)	(132)
Plan amendments	2	8	—	—
Acquisitions/divestitures/other ¹	8	(692)	—	—
Effect of foreign exchange rates	(545)	791	(4)	7
Termination benefits/curtailments/settlements ²	(386)	(49)	—	—
Benefit obligations at end of year	\$ 32,977	\$ 35,309	\$ 1,251	\$ 1,464

<i>Change in plan assets:</i>				
Fair value of plan assets at beginning of year	\$ 26,406	\$ 24,908	\$ —	\$ —
Actual return on plan assets	2,501	2,877	—	—
Employer contributions	1,219	299	—	—
Plan participants' contributions	10	12	—	—
Benefits paid	(1,582)	(1,569)	—	—
Other ³	10	(681)	—	—
Effect of foreign exchange rates	(397)	571	—	—
Settlements	—	(11)	—	—
Fair value of plan assets at end of year	\$ 28,167	\$ 26,406	\$ —	\$ —

<i>Funded status:</i>				
U.S. plans with plan assets	\$ (2,585)	\$ (5,873)	\$ —	\$ —
Non-U.S. plans with plan assets	(1,467)	(2,222)	—	—
All other plans	(758)	(808)	(1,251)	(1,464)
Funded status at end of year	\$ (4,810)	\$ (8,903)	\$ (1,251)	\$ (1,464)

<i>Amounts recognized in the consolidated balance sheets at Dec 31:</i>				
Deferred charges and other assets	\$ 1,173	\$ 1,007	\$ —	\$ —
Accrued and other current liabilities	(58)	(54)	(99)	(113)
Pension and other postretirement benefits - noncurrent	(5,925)	(9,856)	(1,152)	(1,351)
Net amount recognized	\$ (4,810)	\$ (8,903)	\$ (1,251)	\$ (1,464)

<i>Pretax amounts recognized in accumulated other comprehensive loss at Dec 31:</i>				
Net loss (gain)	\$ 9,934	\$ 12,736	\$ (221)	\$ (129)
Prior service credit	(112)	(154)	—	—
Pretax balance in accumulated other comprehensive loss at end of year	\$ 9,822	\$ 12,582	\$ (221)	\$ (129)

1. The 2020 impact relates primarily to the transfer of benefit obligations in the U.S. through the purchase of annuity contracts from an insurance company.
2. The 2021 impact primarily relates to the freeze of pensionable compensation and credited service amounts for employees that participate in the U.S. Plans. The 2020 impact relates to pension plan curtailments of a European plan resulting from the 2020 Restructuring Program and the settlement of certain plan obligations of a U.S. non-qualified pension plan resulting from lump-sum payments.
3. The 2020 impact relates to the purchase of annuity contracts associated with the transfer of benefit obligations to an insurance company.

A significant component of the overall decrease in the Company's benefit obligation for the year ended December 31, 2021 was due to the change in weighted-average discount rates, which increased from 2.20 percent at December 31, 2020 to 2.57 percent at December 31, 2021. A significant component of the overall increase in the Company's benefit obligation for the year ended December 31, 2020 was due to the change in weighted-average discount rates, which decreased from 2.81 percent at December 31, 2019 to 2.20 percent at December 31, 2020.

The accumulated benefit obligation for all significant pension plans was \$32.5 billion and \$34.1 billion at December 31, 2021 and 2020, respectively.

Pension Plans with Accumulated Benefit Obligations in Excess of Plan Assets at Dec 31		
In millions	2021	2020
Accumulated benefit obligations	\$ 27,052	\$ 29,084
Fair value of plan assets	\$ 21,385	\$ 20,130

Pension Plans with Projected Benefit Obligations in Excess of Plan Assets at Dec 31		
In millions	2021	2020
Projected benefit obligations	\$ 27,367	\$ 30,161
Fair value of plan assets	\$ 21,385	\$ 20,251

Net Periodic Benefit Costs for All Significant Plans for the Year Ended Dec 31	<i>Defined Benefit Pension Plans</i>			<i>Other Postretirement Benefit Plans</i>		
	2021	2020	2019	2021	2020	2019
In millions						
<i>Net Periodic Benefit Costs:</i>						
Service cost	\$ 387	\$ 399	\$ 396	\$ 7	\$ 7	\$ 8
Interest cost	594	767	921	23	40	49
Expected return on plan assets	(1,724)	(1,658)	(1,679)	—	—	—
Amortization of prior service credit	(22)	(19)	(20)	—	—	—
Amortization of unrecognized (gain) loss	822	773	574	(6)	(10)	(20)
Curtailment/settlement/other ¹	(18)	9	(27)	—	—	(3)
Net periodic benefit costs	\$ 39	\$ 271	\$ 165	\$ 24	\$ 37	\$ 34
Less: discontinued operations	—	—	21	—	—	—
Net periodic benefit costs - continuing operations	\$ 39	\$ 271	\$ 144	\$ 24	\$ 37	\$ 34
<i>Changes in plan assets and benefit obligations recognized in other comprehensive (income) loss:</i>						
Net (gain) loss	\$ (1,980)	\$ 1,753	\$ 1,606	\$ (98)	\$ 8	\$ 145
Prior service cost	2	8	—	—	—	—
Amortization of prior service credit	22	19	20	—	—	—
Amortization of unrecognized gain (loss)	(822)	(773)	(574)	6	10	20
Common control transaction ²	—	—	(112)	—	—	—
Curtailment and settlement gain (loss) ¹	18	(9)	27	—	—	3
Total recognized in other comprehensive (income) loss	\$ (2,760)	\$ 998	\$ 967	\$ (92)	\$ 18	\$ 168
Total recognized in net periodic benefit cost and other comprehensive (income) loss	\$ (2,721)	\$ 1,269	\$ 1,132	\$ (68)	\$ 55	\$ 202

1. The 2021 impact primarily relates to the freeze of pensionable compensation and credited service amounts for employees that participate in the U.S. Plans. The 2020 impact relates to pension plan curtailments of a European plan resulting from the 2020 Restructuring Program and the settlement of certain plan obligations of a U.S. non-qualified pension plan resulting from lump-sum payments. The 2019 impact relates to plan curtailments and associated special termination benefits resulting from the reduction in plan participation due to the separation from DowDuPont.

2. The 2019 impact is the result of the Company's separation from DowDuPont.

Except for plan curtailment costs related to the 2020 Restructuring Program, which are included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income, non-service cost components of net periodic benefit cost are included in "Sundry income (expense) - net" in the consolidated statements of income. See Notes 6 and 7 for additional information.

Estimated Future Benefit Payments

The estimated future benefit payments of continuing operations, reflecting expected future service, as appropriate, are presented in the following table:

Estimated Future Benefit Payments at Dec 31, 2021		
In millions	<i>Defined Benefit Pension Plans</i>	<i>Other Postretirement Benefit Plans</i>
2022	\$ 1,705	\$ 100
2023	1,548	96
2024	1,551	92
2025	1,576	89
2026	1,593	87
2027-2031	8,093	386
Total	\$ 16,066	\$ 850

Plan Assets

Plan assets consist primarily of equity and fixed income securities of U.S. and foreign issuers, and include alternative investments, such as real estate, private equity and absolute return strategies. Plan assets totaled \$28.2 billion at December 31, 2021 and \$26.4 billion at December 31, 2020 and included no directly held common stock of Dow Inc.

The Company's investment strategy for plan assets is to manage the assets in relation to the liability in order to pay retirement benefits to plan participants over the life of the plans. This is accomplished by identifying and managing the exposure to various market risks, diversifying investments across various asset classes and earning an acceptable long-term rate of return consistent with an acceptable amount of risk, while considering the liquidity needs of the plans.

The plans are permitted to use derivative instruments for investment purposes, as well as for hedging the underlying asset and liability exposure and rebalancing the asset allocation. The plans use value-at-risk, stress testing, scenario analysis and Monte Carlo simulations to monitor and manage both the risk within the portfolios and the surplus risk of the plans.

Equity securities primarily include investments in large- and small-cap companies located in both developed and emerging markets around the world. Fixed income securities include investment and non-investment grade corporate bonds of companies diversified across industries, U.S. treasuries, non-U.S. developed market securities, U.S. agency mortgage-backed securities, emerging market securities and fixed income related funds. Alternative investments primarily include investments in real estate, private equity and absolute return strategies. Other significant investment types include various insurance contracts and interest rate, equity, commodity and foreign exchange derivative investments and hedges.

The Company mitigates the credit risk of investments by establishing guidelines with investment managers that limit investment in any single issue or issuer to an amount that is not material to the portfolio being managed. These guidelines are monitored for compliance both by the Company and external managers. Credit risk related to derivative activity is mitigated by utilizing multiple counterparties, collateral support agreements and centralized clearing, where appropriate. A short-term investment money market fund is utilized as the sweep vehicle for the U.S. plans, which from time to time can represent a significant investment.

The weighted-average target allocation for plan assets of the Company's pension plans is summarized as follows:

Target Allocation for Plan Assets at Dec 31, 2021	
<i>Asset Category</i>	<i>Target Allocation</i>
Equity securities	33 %
Fixed income securities	37
Alternative investments	28
Other investments	2
Total	100 %

Fair value calculations may not be indicative of net realizable value or reflective of future fair values. Furthermore, although the Company believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

For pension plan assets classified as Level 1 measurements (measured using quoted prices in active markets), total fair value is either the price of the most recent trade at the time of the market close or the official close price, as defined by the exchange on which the asset is most actively traded on the last trading day of the period, multiplied by the number of units held without consideration of transaction costs.

For pension plan assets classified as Level 2 measurements, where the security is frequently traded in less active markets, fair value is based on the closing price at the end of the period; where the security is less frequently traded, fair value is based on the price a dealer would pay for the security or similar securities, adjusted for any terms specific to that asset or liability. Market inputs are obtained from well-established and recognized vendors of market data and subjected to tolerance and quality checks. For derivative assets and liabilities, standard industry models are used to calculate the fair value of the various financial instruments based on significant observable market inputs, such as foreign exchange rates, commodity prices, swap rates, interest rates and implied volatilities obtained from various market sources. For other pension plan assets for which observable inputs are used, fair value is derived through the use of fair value models, such as a discounted cash flow model or other standard pricing models.

For pension plan assets classified as Level 3 measurements, total fair value is based on significant unobservable inputs including assumptions where there is little, if any, market activity for the investment.

Certain pension plan assets are held in funds where fair value is based on an estimated net asset value per share (or its equivalent) as of the most recently available fund financial statements which are received on a monthly or quarterly basis. These valuations are reviewed for reasonableness based on applicable sector, benchmark and company performance. Adjustments to valuations are made where appropriate to arrive at an estimated net asset value per share at the measurement date. These funds are not classified within the fair value hierarchy.

The following table summarizes the bases used to measure the Company's pension plan assets at fair value for the years ended December 31, 2021 and 2020:

Basis of Fair Value Measurements	Dec 31, 2021				Dec 31, 2020			
	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
In millions								
Cash and cash equivalents	\$ 1,463	\$ 1,353	\$ 110	\$ —	\$ 1,298	\$ 1,103	\$ 195	\$ —
Equity securities:								
U.S. equity securities ¹	\$ 4,117	\$ 4,097	\$ 18	\$ 2	\$ 3,934	\$ 3,911	\$ 22	\$ 1
Non - U.S. equity securities	4,559	3,935	620	4	5,186	4,213	964	9
Total equity securities	\$ 8,676	\$ 8,032	\$ 638	\$ 6	\$ 9,120	\$ 8,124	\$ 986	\$ 10
Fixed income securities:								
Debt - government-issued	\$ 4,838	\$ 242	\$ 4,596	\$ —	\$ 4,998	\$ 128	\$ 4,870	\$ —
Debt - corporate-issued	4,949	1,095	3,854	—	3,970	553	3,416	1
Debt - asset-backed	117	—	116	1	103	—	102	1
Total fixed income securities	\$ 9,904	\$ 1,337	\$ 8,566	\$ 1	\$ 9,071	\$ 681	\$ 8,388	\$ 2
Alternative investments:								
Private markets	\$ 5	\$ —	\$ —	\$ 5	\$ 13	\$ —	\$ —	\$ 13
Real estate	67	67	—	—	51	51	—	—
Derivatives - asset position	399	2	397	—	697	2	695	—
Derivatives - liability position	(324)	(2)	(322)	—	(594)	(1)	(593)	—
Total alternative investments	\$ 147	\$ 67	\$ 75	\$ 5	\$ 167	\$ 52	\$ 102	\$ 13
Other investments	\$ 1,068	\$ 7	\$ 1,061	\$ —	\$ 472	\$ 22	\$ 448	\$ 2
Subtotal	\$ 21,258	\$ 10,796	\$ 10,450	\$ 12	\$ 20,128	\$ 9,982	\$ 10,119	\$ 27
Investments measured at net asset value:								
Hedge funds	\$ 1,312				\$ 1,350			
Private markets	3,857				3,135			
Real estate	1,793				1,886			
Total investments measured at net asset value	\$ 6,962				\$ 6,371			
Items to reconcile to fair value of plan assets:								
Pension trust receivables ²	\$ 62				\$ 66			
Pension trust payables ³	(115)				(159)			
Total	\$ 28,167				\$ 26,406			

1. No Dow Inc. common stock was directly held at December 31, 2021 or December 31, 2020.

2. Primarily receivables for investment securities sold.

3. Primarily payables for investment securities purchased.

The following table summarizes the changes in the fair value of Level 3 pension plan assets for the years ended December 31, 2021 and 2020:

Fair Value Measurement of Level 3 Pension Plan Assets	<i>Equity Securities</i>	<i>Fixed Income Securities</i>	<i>Alternative Investments</i>	<i>Other Investments</i>	<i>Total</i>
In millions					
Balance at Jan 1, 2020	\$ 27	\$ 2	\$ 11	\$ —	\$ 40
Actual return on assets:					
Relating to assets sold during 2020	—	—	(11)	—	(11)
Relating to assets held at Dec 31, 2020	(1)	—	8	(1)	6
Purchases, sales and settlements, net	(19)	(1)	5	3	(12)
Transfers out of Level 3, net	3	1	—	—	4
Balance at Dec 31, 2020	\$ 10	\$ 2	\$ 13	\$ 2	\$ 27
Actual return on assets:					
Relating to assets held at Dec 31, 2021	1	—	(11)	—	(10)
Purchases, sales and settlements, net	(5)	(1)	3	(2)	(5)
Balance at Dec 31, 2021	\$ 6	\$ 1	\$ 5	\$ —	\$ 12

Defined Contribution Plans

U.S. employees may participate in defined contribution plans by contributing a portion of their compensation, which is partially matched by the Company. Defined contribution plans also cover employees in some subsidiaries in other countries, including China, Brazil, The Netherlands, Canada, Korea, Spain and the United Kingdom. Expense of continuing operations recognized for all defined contribution plans was \$165 million in 2021, \$156 million in 2020 and \$163 million in 2019.

On March 4, 2021, the Company announced changes to its U.S. tax-qualified and non-qualified defined contribution plans. Effective January 1, 2022, contributions to U.S. tax-qualified and non-qualified defined contribution plans will be harmonized across the Company's U.S. eligible employee population. The new matching contribution will allow all eligible U.S. employees to receive matching contributions of up to 5 percent of their eligible compensation. In addition, beginning on January 1, 2024, all eligible U.S. employees will receive an automatic non-elective contribution of 4 percent of eligible compensation to their respective defined contribution plans.

NOTE 21 – STOCK-BASED COMPENSATION

The Company provides stock-based compensation in the form of the Employee Stock Purchase Plan, which grants eligible employees the right to purchase shares of the Company's common stock at a discounted price. The Company also grants stock-based compensation to employees and non-employee directors under stock incentive plans, in the form of stock options, stock appreciation rights, PSUs and RSUs.

In connection with the Merger, on August 31, 2017 ("Conversion Date"), all outstanding TDCC stock options and RSU awards were converted into stock options and RSU awards with respect to DowDuPont common stock. The stock options and RSU awards had the same terms and conditions under the applicable plans and award agreements prior to the Merger. All outstanding and nonvested PSU awards were converted into RSU awards with respect to DowDuPont common stock at the greater of the applicable performance target or the actual performance as of the effective time of the Merger. Changes in the fair value of liability instruments are recognized as compensation expense each quarter. TDCC and Historical DuPont did not merge their stock-based compensation plans as a result of the Merger. TDCC and Historical DuPont stock-based compensation plans were assumed by DowDuPont and continued in place with the ability to grant and issue DowDuPont common stock until separation.

In connection with the separation on April 1, 2019, outstanding stock options, RSU and PSU awards were converted to Dow Inc. denominated awards under the "Employer Method," or DowDuPont denominated awards under the "Shareholder Method," and adjusted to maintain the intrinsic value of those awards before and after the date of the separation. In connection with the Corteva separation transaction on June 3, 2019, the outstanding DowDuPont denominated stock options, RSU and PSU awards were converted to Corteva and DuPont denominated awards and adjusted to maintain the intrinsic value of those awards before and after the date of the Corteva separation. The awards have the same terms and conditions under the applicable plans and award agreements prior to the separation transactions.

The conversions of stock awards resulted in no incremental compensation expense. Approximately 5,000 employees were impacted by the conversion on April 1, 2019 in connection with Dow Inc.'s separation from DowDuPont. Approximately 4,000 employees were impacted by the conversion on June 3, 2019 in connection with the Corteva separation transaction.

The total stock-based compensation expense included in continuing operations in the consolidated statements of income was \$276 million, \$171 million and \$158 million in 2021, 2020 and 2019, respectively. The income tax benefits related to stock-based compensation arrangements were \$62 million, \$39 million and \$36 million in 2021, 2020 and 2019, respectively. Amounts disclosed throughout the remainder of this footnote are inclusive of activity attributable to both continuing operations and discontinued operations, as the impact of discontinued operations is not significant.

Accounting for Stock-Based Compensation

The Company grants stock-based compensation awards that vest over a specified period or upon employees meeting certain performance and/or retirement eligibility criteria. The fair value of equity instruments issued to employees is measured on the grant date. The fair value of liability instruments (granted to executive employees subject to stock ownership requirements, that provide the recipient the option to elect to receive a cash payment equal to the value of the stock award on the date of delivery) is measured at the end of each quarter. The fair value of equity and liability instruments is expensed over the vesting period or, in the case of retirement, from the grant date to the date on which retirement eligibility provisions have been met and additional service is no longer required. The Company estimates expected forfeitures based on historical activity.

The Company uses the Black-Scholes option valuation model to estimate the fair value of stock options. The weighted-average assumptions used to calculate total stock-based compensation are included in the following table:

Weighted-Average Assumptions	2021	2020	2019
Dividend yield	4.86 %	5.80 %	5.10 %
Expected volatility	33.40 %	26.70 %	26.10 %
Risk-free interest rate	0.68 %	1.49 %	2.43 %
Expected life of stock options granted during period (years)	6.25	6.1	6.1

The dividend yield assumption was equal to the dividend yield on the grant date, which reflected the Company's quarterly dividend payments of \$0.70 per share in 2021, 2020 and 2019 on Dow Inc. Common Stock. The expected volatility assumptions for the 2021, 2020 and 2019 stock options were based on an equal weighting of the historical daily volatility for the expected term of the awards and current implied volatility from exchange-traded options. The expected volatility assumption for the market portion of the 2021, 2020 and 2019 PSU awards were based on historical daily volatility for the term of the award. The risk-free interest rate was based on the U.S. Treasury strip rates over the expected life of the 2021, 2020 and 2019 options. The expected life of stock options granted was based on an analysis of historical exercise patterns.

Stock Incentive Plan

The Company has historically granted equity awards under various plans (the "Prior Plans"). On February 9, 2012, the Board authorized The Dow Chemical Company 2012 Stock Incentive Plan (the "2012 Plan"), which was approved by stockholders at TDCC's annual meeting on May 10, 2012 ("2012 Plan Effective Date") and became effective on that date. On February 13, 2014, the Board adopted The Dow Chemical Company Amended and Restated 2012 Stock Incentive Plan (the "2012 Restated Plan"). The 2012 Restated Plan was approved by stockholders at TDCC's annual meeting on May 15, 2014, and became effective on that date. The Prior Plans were superseded by the 2012 Plan and the 2012 Restated Plan (collectively, the "2012 Plan"). Under the 2012 Plan, the Company granted options, RSUs, PSUs, restricted stock, stock appreciation rights and stock units to employees and non-employee directors, subject to an aggregate limit and annual individual limits. The terms of the grants were fixed at the grant date. TDCC's stock-based compensation programs were assumed by DowDuPont and continued in place with the ability to grant and issue DowDuPont common stock until separation.

On April 1, 2019 ("Original Effective Date"), in connection with the separation, the Company adopted the 2019 Stock Incentive Plan (the "2019 Plan"). Under the 2019 Plan, the Company may grant stock options, RSUs, PSUs, stock appreciation rights and stock units to employees and non-employee directors until the tenth anniversary of the Original Effective Date, subject to an aggregate limit and annual individual limits. The terms of the grants are fixed at the grant date. At December 31, 2021, there were approximately 59 million shares of common stock available for grant under the 2019 Plan.

Stock Options

The Company grants stock options to certain employees, subject to certain annual and individual limits, with terms of the grants fixed at the grant date. The exercise price of each stock option equals the market price of the common stock on the grant date. Options vest from one year to three years and have a maximum term of ten years. The following table summarizes stock option activity for 2021:

Stock Options	2021	
	Shares	Exercise Price ¹
Shares in thousands		
Outstanding at Jan 1, 2021	20,252	\$ 47.44
Granted	1,309	\$ 57.67
Exercised	(5,179)	\$ 39.97
Forfeited/Expired	(102)	\$ 60.36
Outstanding at Dec 31, 2021	16,280	\$ 50.56
Remaining contractual life in years		4.65
Aggregate intrinsic value in millions	\$ 141	
Exercisable at Dec 31, 2021	13,106	\$ 49.96
Remaining contractual life in years		3.75
Aggregate intrinsic value in millions	\$ 128	

1. Weighted-average per share.

Additional Information about Stock Options	2021	2020	2019
In millions, except per share amounts			
Weighted-average fair value per share of options granted	\$ 10.37	\$ 5.89	\$ 7.99
Total compensation expense for stock option plans	\$ 14	\$ 22	\$ 23
Related tax benefit	\$ 3	\$ 5	\$ 5
Total amount of cash received from the exercise of options	\$ 217	\$ 108	\$ 93
Total intrinsic value of options exercised ¹	\$ 121	\$ 41	\$ 77
Related tax benefit	\$ 27	\$ 9	\$ 17

1. Difference between the market price at exercise and the price paid by the employee to exercise the options.

Total unrecognized compensation cost related to unvested stock option awards of \$5 million at December 31, 2021, is expected to be recognized over a weighted-average period of 1.47 years.

Restricted Stock Units

The Company grants RSUs to certain employees and non-employee directors. The grants vest after a designated period of time, generally three years for employees and two years for non-employee directors. The following table shows changes in nonvested RSUs:

RSU Awards	2021	
	Shares	Grant Date Fair Value ¹
Shares in thousands		
Nonvested at Jan 1, 2021	3,007	\$ 53.78
Granted	1,715	\$ 57.96
Vested	(1,063)	\$ 60.86
Canceled	(116)	\$ 54.17
Nonvested at Dec 31, 2021	3,543	\$ 53.67

1. Weighted-average per share.

Additional Information about RSUs	2021	2020	2019
In millions, except per share amounts			
Weighted-average fair value per share of RSUs granted	\$ 57.96	\$ 47.66	\$ 54.78
Total fair value of RSUs vested ¹	\$ 33	\$ 106	\$ 264
Related tax benefit	\$ 7	\$ 24	\$ 59
Total compensation expense for RSU awards	\$ 95	\$ 93	\$ 110
Related tax benefit	\$ 21	\$ 21	\$ 25

1. Includes the fair value of shares vested in prior years and delivered in the reporting year.

In 2021, the Company did not settle any RSU's in cash (approximately 85,000 RSUs settled in cash for \$4 million in 2020 and 341,000 RSUs settled in cash for \$19 million in 2019). Total unrecognized compensation cost related to RSU awards of \$71 million at December 31, 2021 is expected to be recognized over a weighted-average period of 1.64 years. At December 31, 2021, approximately 1.8 million RSUs with a grant date weighted-average fair value per share of \$52.92 had previously vested, but were not issued. These shares are scheduled to be issued to employees within six months to three years or to non-employee directors upon retirement.

Performance Stock Units

The Company grants PSUs to certain employees. The grants vest when the Company attains specified performance targets, such as return on capital, cumulative cash from operations and relative total shareholder return, over a predetermined period, generally one year to three years. Performance and payouts are determined independently for each metric. Compensation expense related to PSU awards is recognized over the lesser of the service or performance period. Changes in the fair value of liability instruments are recognized as compensation expense each quarter.

The following table shows the PSU awards granted:

PSU Awards		Target Shares Granted ¹	Grant Date Fair Value ²
Year	Performance Period		
2021	Jan 1, 2021 – Dec 31, 2023	1,223	\$ 61.48
2020	Jan 1, 2020 – Dec 31, 2022	1,426	\$ 48.35
2019	Apr 1, 2019 – Dec 31, 2021	1,173	\$ 57.58

1. At the end of the performance period, the actual number of shares issued can range from zero to 200 percent of target shares granted for the 2019 and 2021 awards and can range from zero to 100 percent of the target shares granted for the 2020 award.

2. Weighted-average per share.

The following table shows changes in nonvested PSUs:

PSUs	2021	
	Shares	Grant Date Fair Value ¹
Shares in thousands		
Nonvested at Jan 1, 2021	2,488	\$ 53.78
Granted	1,223	\$ 61.48
Vested	—	\$ —
Canceled	(72)	\$ 56.99
Nonvested at Dec 31, 2021	3,639	\$ 55.36

1. Weighted-average per share.

Additional Information about PSUs	2021	2020	2019
In millions, except share amounts			
Total fair value of PSUs vested and delivered ¹	\$ —	\$ —	\$ 18
Related tax benefit	\$ —	\$ —	\$ 4
Total compensation expense for PSU awards	\$ 138	\$ 56	\$ 25
Related tax benefit	\$ 31	\$ 13	\$ 6
Shares of PSUs settled in cash (in thousands) ²	—	—	162
Total cash paid to settle PSUs ³	\$ —	\$ —	\$ 13

1. Includes the fair value of shares vested in prior years and delivered in the reporting year.

2. PSU awards vested in prior years and delivered in the reporting year.

3. Cash paid to certain executive employees for PSU awards vested in prior periods and delivered in the reporting year, equal to the value of the stock award on the date of delivery.

Total unrecognized compensation cost related to PSU awards of \$49 million at December 31, 2021, is expected to be recognized over a weighted-average period of 1.66 years.

Employee Stock Purchase Plan

The Board unanimously approved the Dow Inc. 2021 Employee Stock Purchase Plan (the "2021 ESPP"), which was approved by the Company's stockholders at the 2021 Annual Meeting of Stockholders held on April 15, 2021. Under the 2021 ESPP offering, most employees were eligible to purchase shares of common stock of Dow Inc. valued at up to 10 percent of their annual total base salary or wages. The number of shares purchased was determined using the amount contributed by the employee divided by the plan price. The plan price of the stock was equal to 85 percent of the fair market value (closing price) of the common stock at June 1, 2021 (beginning) or December 3, 2021 (ending) of the offering period, whichever was lower.

In 2021, employees subscribed to the right to purchase approximately 2.3 million shares at a weighted-average price of \$45.11 per share, under the 2021 ESPP. The plan price was fixed upon the close of the offering period. The shares were delivered to employees in the fourth quarter of 2021.

Additional Information about Employee Stock Purchase Plan	2021
In millions, except per share amounts	
Weighted-average fair value per share of purchase rights granted	\$ 16.26
Total compensation expense for ESPP	\$ 30
Related tax benefit	\$ 7
Total amount of cash received from the exercise of purchase rights	\$ 103
Total intrinsic value of purchase rights exercised ¹	\$ 18
Related tax benefit	\$ 4

1. Difference between the market price at exercise and the price paid by the employee to exercise the purchase rights.

NOTE 22 – FINANCIAL INSTRUMENTS

The following table summarizes the fair value of financial instruments at December 31, 2021 and 2020:

Fair Value of Financial Instruments at Dec 31 In millions	2021				2020			
	Cost	Gain	Loss	Fair Value	Cost	Gain	Loss	Fair Value
Cash equivalents:								
Held-to-maturity securities ¹	\$ 317	\$ —	\$ —	\$ 317	\$ 980	\$ —	\$ —	\$ 980
Money market funds	489	—	—	489	484	—	—	484
Total cash equivalents	\$ 806	\$ —	\$ —	\$ 806	\$ 1,464	\$ —	\$ —	\$ 1,464
Marketable securities ²	\$ 237	\$ 8	\$ —	\$ 245	\$ 45	\$ —	\$ —	\$ 45
Other investments:								
Debt securities:								
Government debt ³	\$ 746	\$ 17	\$ (28)	\$ 735	\$ 673	\$ 35	\$ (10)	\$ 698
Corporate bonds	1,251	93	(20)	1,324	822	119	(5)	936
Total debt securities	\$ 1,997	\$ 110	\$ (48)	\$ 2,059	\$ 1,495	\$ 154	\$ (15)	\$ 1,634
Equity securities ⁴	7	13	—	20	6	34	—	40
Total other investments	\$ 2,004	\$ 123	\$ (48)	\$ 2,079	\$ 1,501	\$ 188	\$ (15)	\$ 1,674
Total cash equivalents, marketable securities and other investments	\$ 3,047	\$ 131	\$ (48)	\$ 3,130	\$ 3,010	\$ 188	\$ (15)	\$ 3,183
Long-term debt including debt due within one year ⁵	\$ (14,511)	\$ 27	\$ (2,641)	\$ (17,125)	\$ (16,951)	\$ 6	\$ (3,659)	\$ (20,604)
Derivatives relating to:								
Interest rates ⁶	\$ —	\$ 1	\$ (140)	\$ (139)	\$ —	\$ 41	\$ (182)	\$ (141)
Foreign currency	—	46	(18)	28	—	69	(84)	(15)
Commodities ⁶	—	142	(92)	50	—	63	(84)	(21)
Total derivatives	\$ —	\$ 189	\$ (250)	\$ (61)	\$ —	\$ 173	\$ (350)	\$ (177)

1. The Company's held-to-maturity securities primarily included treasury bills and time deposits.

2. The Company's investments in marketable securities are included in "Other current assets" in the consolidated balance sheets.

3. U.S. Treasury obligations, U.S. agency obligations, U.S. agency mortgage-backed securities and other municipalities' obligations.

4. Equity securities with a readily determinable fair value.

5. Cost includes fair value hedge adjustment gains of \$47 million at December 31, 2021 and \$69 million at December 31, 2020 on \$2,279 million of debt at December 31, 2021 and \$3,314 million of debt at December 31, 2020.

6. Presented net of cash collateral where master netting arrangements allow.

Cost approximates fair value for all other financial instruments.

Debt Securities

The Company's investments in debt securities are primarily classified as available-for-sale. The following table provides the investing results from available-for-sale securities for the years ended December 31, 2021, 2020 and 2019.

Investing Results In millions	2021	2020	2019
Proceeds from sales of available-for-sale securities	\$ 424	\$ 837	\$ 1,138
Gross realized gains	\$ 50	\$ 94	\$ 51
Gross realized losses	\$ 12	\$ 40	\$ 18

The following table summarizes the contractual maturities of the Company's investments in debt securities:

Contractual Maturities of Debt Securities at Dec 31, 2021 ¹	<i>Cost</i>	<i>Fair Value</i>
In millions		
Within one year	\$ 34	\$ 37
One to five years	672	697
Six to ten years	743	743
After ten years	548	582
Total	\$ 1,997	\$ 2,059

1. Includes marketable securities with maturities of less than one year.

Portfolio managers regularly review the Company's holdings to determine if any investments in debt securities are other-than-temporarily impaired. The analysis includes reviewing the amount of the impairment, as well as the length of time it has been impaired.

The credit rating of the issuer, current credit rating trends, the trends of the issuer's overall sector, the ability of the issuer to pay expected cash flows and the length of time the security has been in a loss position are considered in determining whether unrealized losses represent an other-than-temporary impairment. The Company did not have any credit-related losses in 2021, 2020 or 2019.

The following table provides the fair value and gross unrealized losses of the Company's investments in debt securities that were deemed to be temporarily impaired at December 31, 2021 and 2020, aggregated by investment category:

Temporarily Impaired Debt Securities at Dec 31	<i>Less than 12 months</i>		<i>12 months or more</i>		<i>Total</i>	
	<i>Fair Value</i>	<i>Unrealized Losses</i>	<i>Fair Value</i>	<i>Unrealized Losses</i>	<i>Fair Value</i>	<i>Unrealized Losses</i>
In millions						
2021						
Government debt ¹	\$ 295	\$ (13)	\$ 151	\$ (15)	\$ 446	\$ (28)
Corporate bonds	355	(17)	16	(3)	371	(20)
Total temporarily impaired debt securities	\$ 650	\$ (30)	\$ 167	\$ (18)	\$ 817	\$ (48)
2020						
Government debt ¹	\$ 124	\$ (3)	\$ 7	\$ (7)	\$ 131	\$ (10)
Corporate bonds	55	(3)	12	(2)	67	(5)
Total temporarily impaired debt securities	\$ 179	\$ (6)	\$ 19	\$ (9)	\$ 198	\$ (15)

1. U.S. Treasury obligations, U.S. agency obligations, U.S. agency mortgage-backed securities and other municipalities' obligations.

Equity Securities

There were no material adjustments to the carrying value of the not readily determinable investments for impairment or observable price changes for the year ended December 31, 2021. The net unrealized loss recognized in earnings on equity securities totaled \$13 million for the year ended December 31, 2021 (\$32 million net unrealized gain for the year ended December 31, 2020).

Investments in Equity Securities	<i>Dec 31, 2021</i>	<i>Dec 31, 2020</i>
In millions		
Readily determinable fair value	\$ 20	\$ 40
Not readily determinable fair value	\$ 209	\$ 215

Risk Management

The Company's business operations give rise to market risk exposure due to changes in foreign exchange rates, interest rates, commodity prices and other market factors such as equity prices. To manage such risks effectively, the Company enters into hedging transactions, pursuant to established guidelines and policies that enable it to mitigate the adverse effects of financial market risk. Derivatives used for this purpose are designated as hedges per the accounting guidance related to derivatives and hedging activities, where appropriate. A secondary objective is to add value by creating additional non-specific exposure within established limits and policies; derivatives used for this purpose are not designated as hedges. The potential impact of creating such additional exposures is not material to the Company's results. Accounting guidance requires companies to recognize all derivative instruments as either assets or liabilities at fair value.

The Company's risk management program for interest rate, foreign currency and commodity risks is based on fundamental, mathematical and technical models that take into account the implicit cost of hedging. Risks created by derivative instruments and the mark-to-market valuations of positions are strictly monitored at all times, using value-at-risk and stress tests. Counterparty credit risk arising from these contracts is not significant because the Company minimizes counterparty concentration, deals primarily with major financial institutions of solid credit quality, and the majority of its hedging transactions mature in less than three months. In addition, the Company minimizes concentrations of credit risk through its global orientation by transacting with large, internationally diversified financial counterparties. It is the Company's policy to not have credit risk-related contingent features in its derivative instruments. No significant concentration of counterparty credit risk existed at December 31, 2021. The Company does not anticipate losses from credit risk, and the net cash requirements arising from counterparty risk associated with risk management activities are not expected to be material in 2022.

The Company revises its strategies as market conditions dictate and management reviews its overall financial strategies and the impacts from using derivatives in its risk management program with the Company's senior leadership who also reviews these strategies with the Dow Inc. Board and/or relevant committees thereof.

Derivative Instruments

The notional amounts of the Company's derivative instruments presented on a net basis at December 31, 2021 and 2020, were as follows:

Notional Amounts - Net		<i>Dec 31, 2021</i>	<i>Dec 31, 2020</i>
In millions			
Derivatives designated as hedging instruments			
Interest rate contracts		\$ 3,000	\$ 612
Foreign currency contracts		\$ 5,300	\$ 3,784
Derivatives not designated as hedging instruments			
Interest rate contracts		\$ 36	\$ 94
Foreign currency contracts		\$ 8,234	\$ 9,187

The notional amounts of the Company's commodity derivatives presented on a net basis at December 31, 2021 and 2020, were as follows:

Commodity Notionals - Net	<i>Dec 31, 2021</i>	<i>Dec 31, 2020</i>	<i>Notional Volume Unit</i>
Derivatives designated as hedging instruments			
Hydrocarbon derivatives	9.7	10.9	million barrels of oil equivalent
Derivatives not designated as hedging instruments			
Hydrocarbon derivatives	0.1	—	million barrels of oil equivalent
Power derivatives	3.3	—	thousands of megawatt hours

Maturity Dates of Derivatives Designated as Hedging Instruments	<i>Year</i>
Interest rate contracts	2023
Foreign currency contracts	2023
Commodity contracts	2023

Interest Rate Risk Management

The main objective of interest rate risk management is to reduce the total funding cost to the Company and to alter the interest rate exposure to the desired risk profile. To achieve this objective, the Company hedges using interest rate swaps, "swaptions," and exchange-traded instruments.

Foreign Currency Risk Management

The global nature of the Company's business requires active participation in the foreign exchange markets. The Company has assets, liabilities and cash flows in currencies other than the U.S. dollar. The primary objective of the Company's foreign currency risk management is to optimize the U.S. dollar value of net assets and cash flows. To achieve this objective, the Company hedges on a net exposure basis using foreign currency forward contracts, over-the-counter option contracts, cross-currency swaps and nonderivative instruments in foreign currencies. Exposures primarily relate to assets, liabilities and bonds denominated in foreign currencies, as well as economic exposure, which is derived from the risk that currency fluctuations could affect the dollar value of future cash flows related to operating activities.

Commodity Risk Management

The Company has exposure to the prices of commodities in its procurement of certain raw materials. The primary purpose of commodity hedging activities is to manage the price volatility associated with these forecasted inventory purchases.

Derivatives Not Designated in Hedging Relationships

Foreign Currency Contracts

The Company also uses foreign exchange forward contracts, options and cross-currency swaps that are not designated as hedging instruments primarily to manage foreign currency exposure.

Commodity Contracts

The Company utilizes futures, options and swap instruments that are effective as economic hedges of commodity price exposures, but do not meet hedge accounting criteria for derivatives and hedging, to reduce exposure to commodity price fluctuations on purchases of raw materials and inventory.

Interest Rate Contracts

The Company uses swap instruments that are not designated as hedging instruments to manage interest rate exposures. The Company uses interest rate swaps, "swaptions," and exchange-traded instruments to accomplish this objective.

Accounting for Derivative Instruments and Hedging Activities

Cash Flow Hedges

For derivatives that are designated and qualify as cash flow hedging instruments, the gain or loss on the derivative is recorded in AOCL; it is reclassified to income in the same period or periods that the hedged transaction affects income. The unrealized amounts in AOCL fluctuate based on changes in the fair value of open contracts at the end of each reporting period. The Company anticipates volatility in AOCL and net income from its cash flow hedges. The amount of volatility varies with the level of derivative activities and market conditions during any period.

The portion of the mark-to-market effects of the foreign currency contracts is recorded in AOCL; it is reclassified to income in the same period or periods that the underlying item affects income.

Commodity swaps, futures and option contracts with maturities of not more than 60 months are utilized and designated as cash flow hedges of forecasted commodity purchases. The designated portion of the mark-to-market effect of the cash flow hedge instrument is recorded in AOCL; it is reclassified to income in the same period or periods that the underlying commodity purchase affects income.

Fair Value Hedges

For interest rate instruments that are designated and qualify as fair value hedges, the gain or loss on the derivative as well as the offsetting loss or gain on the hedge item attributable to the hedged risk are recognized in current period income and reflected as "Interest expense and amortization of debt discount" in the consolidated statements of income, except for amounts excluded from the assessment of effectiveness that are recognized in earnings through an amortization approach.

Net Foreign Investment Hedges

The Company designates derivatives that qualify as effective net foreign investment hedges, the results of which are presented in the effect of derivative instruments table. The Company also utilizes non-derivative instruments as net foreign investment hedges. The Company had outstanding foreign-currency denominated debt designated as a hedge of net foreign investment of \$174 million at December 31, 2021 (\$194 million at December 31, 2020).

The following tables provide the fair value and balance sheet classification of derivative instruments at December 31, 2021 and 2020:

Fair Value of Derivative Instruments		Dec 31, 2021		
		Gross	Counterparty and Cash Collateral Netting ¹	Net Amounts Included in Consolidated Balance Sheets
In millions	Balance Sheet Classification			
Asset derivatives				
Derivatives designated as hedging instruments				
Interest rate contracts	Other current assets	\$ 14	\$ (14)	\$ —
Interest rate contracts	Deferred charges and other assets	130	(130)	—
Foreign currency contracts	Other current assets	24	(13)	11
Foreign currency contracts	Deferred charges and other assets	117	(89)	28
Commodity contracts	Other current assets	305	(173)	132
Commodity contracts	Deferred charges and other assets	9	(2)	7
Total		\$ 599	\$ (421)	\$ 178
Derivatives not designated as hedging instruments				
Interest rate contracts	Other current assets	\$ 1	\$ —	\$ 1
Foreign currency contracts	Other current assets	23	(16)	7
Foreign currency contracts	Deferred charges and other assets	1	(1)	—
Commodity contracts	Other current assets	8	(5)	3
Total		\$ 33	\$ (22)	\$ 11
Total asset derivatives		\$ 632	\$ (443)	\$ 189
Liability derivatives				
Derivatives designated as hedging instruments				
Interest rate contracts	Accrued and other current liabilities	\$ 33	\$ (14)	\$ 19
Interest rate contracts	Other noncurrent obligations	192	(130)	62
Foreign currency contracts	Accrued and other current liabilities	15	(13)	2
Foreign currency contracts	Other noncurrent obligations	90	(89)	1
Commodity contracts	Accrued and other current liabilities	267	(192)	75
Commodity contracts	Other noncurrent obligations	2	(2)	—
Total		\$ 599	\$ (440)	\$ 159
Derivatives not designated as hedging instruments				
Interest rate contracts	Accrued and other current liabilities	\$ 59	\$ —	\$ 59
Foreign currency contracts	Accrued and other current liabilities	31	(16)	15
Foreign currency contracts	Other noncurrent obligations	1	(1)	—
Commodity contracts	Accrued and other current liabilities	25	(8)	17
Total		\$ 116	\$ (25)	\$ 91
Total liability derivatives		\$ 715	\$ (465)	\$ 250

1. Counterparty and cash collateral amounts represent the estimated net settlement amount when applying netting and set-off rights included in master netting arrangements between the Company and its counterparties and the payable or receivable for cash collateral held or placed with the same counterparty.

Fair Value of Derivative Instruments		Dec 31, 2020		
			Counterparty and Cash Collateral Netting ¹	Net Amounts Included in Consolidated Balance Sheets
In millions	Balance Sheet Classification	Gross		
Asset derivatives				
Derivatives designated as hedging instruments				
Interest rate contracts	Other current assets	\$ 3	\$ (3)	\$ —
Foreign currency contracts	Other current assets	39	(19)	20
Commodity contracts	Other current assets	146	(109)	37
Commodity contracts	Deferred charges and other assets	31	(8)	23
Total		\$ 219	\$ (139)	\$ 80
Derivatives not designated as hedging instruments				
Interest rate contracts	Deferred charges and other assets	\$ 41	\$ —	\$ 41
Foreign currency contracts	Other current assets	74	(25)	49
Commodity contracts	Other current assets	4	(1)	3
Total		\$ 119	\$ (26)	\$ 93
Total asset derivatives		\$ 338	\$ (165)	\$ 173
Liability derivatives				
Derivatives designated as hedging instruments				
Interest rate contracts	Accrued and other current liabilities	\$ 7	\$ (3)	\$ 4
Foreign currency contracts	Accrued and other current liabilities	93	(19)	74
Commodity contracts	Accrued and other current liabilities	151	(112)	39
Commodity contracts	Other noncurrent obligations	48	(9)	39
Total		\$ 299	\$ (143)	\$ 156
Derivatives not designated as hedging instruments				
Interest rate contracts	Other noncurrent obligations	\$ 178	\$ —	\$ 178
Foreign currency contracts	Accrued and other current liabilities	35	(25)	10
Commodity contracts	Accrued and other current liabilities	9	(3)	6
Total		\$ 222	\$ (28)	\$ 194
Total liability derivatives		\$ 521	\$ (171)	\$ 350

1. Counterparty and cash collateral amounts represent the estimated net settlement amount when applying netting and set-off rights included in master netting arrangements between the Company and its counterparties and the payable or receivable for cash collateral held or placed with the same counterparty.

Assets and liabilities related to forward contracts, interest rate swaps, currency swaps, options and other conditional or exchange contracts executed with the same counterparty under a master netting arrangement are netted. Collateral accounts are netted with corresponding assets or liabilities, when applicable. The Company posted cash collateral of \$71 million at December 31, 2021 (\$7 million at December 31, 2020). No cash collateral was posted by counterparties with the Company at December 31, 2021 and December 31, 2020).

The following table summarizes the gain (loss) of derivative instruments in the consolidated statements of income and comprehensive income for the years ended December 31, 2021, 2020 and 2019:

Effect of Derivative Instruments In millions	Amount of gain (loss) recognized in OCI ¹			Amount of gain (loss) recognized in income ²			Income Statement Classification
	2021	2020	2019	2021	2020	2019	
Derivatives designated as hedging instruments:							
Fair value hedges:							
Interest rate contracts	\$ —	\$ —	\$ —	\$ (25)	\$ 69	\$ 17	Interest expense and amortization of debt discount ³
Excluded components ⁴	2	7	(3)	—	—	—	Interest expense and amortization of debt discount
Cash flow hedges:							
Interest rate contracts	(62)	—	(316)	(9)	(2)	1	Interest expense and amortization of debt discount
Foreign currency contracts	13	(20)	16	(15)	3	28	Cost of sales
Foreign currency contracts	—	—	10	—	—	8	Sundry income (expense) - net
Commodity contracts	133	(8)	(6)	62	(31)	(81)	Cost of sales
Net foreign investment hedges:							
Foreign currency contracts	31	(38)	(52)	—	—	—	
Excluded components ⁴	54	27	162	11	20	99	Sundry income (expense) - net
Total derivatives designated as hedging instruments	\$ 171	\$ (32)	\$ (189)	\$ 24	\$ 59	\$ 72	
Derivatives not designated as hedging instruments:							
Interest rate contracts	\$ —	\$ —	\$ —	\$ (8)	\$ (16)	\$ (4)	Interest expense and amortization of debt discount
Foreign currency contracts	—	—	—	(253)	28	45	Sundry income (expense) - net
Commodity contracts	—	—	—	(46)	11	(28)	Cost of sales
Total derivatives not designated as hedging instruments	\$ —	\$ —	\$ —	\$ (307)	\$ 23	\$ 13	
Total derivatives	\$ 171	\$ (32)	\$ (189)	\$ (283)	\$ 82	\$ 85	

1. OCI is defined as other comprehensive income (loss).

2. Pretax amounts.

3. Gain (loss) recognized in income of derivatives is offset by gain (loss) recognized in income of the hedged item.

4. The excluded components are related to the time value of the derivatives designated as hedges.

The following table provides the net after-tax amounts to be reclassified from AOCL to income within the next 12 months:

Expected Reclassifications from AOCL within the next 12 months	Dec 31, 2021
Cash flow hedges:	
Interest rate contracts	\$ (8)
Commodity contracts	\$ 52
Foreign currency contracts	\$ 8
Net foreign investment hedges:	
Excluded components	\$ 29

NOTE 23 – FAIR VALUE MEASUREMENTS

Fair Value Measurements on a Recurring Basis

The following table summarizes the bases used to measure certain assets and liabilities at fair value on a recurring basis:

Basis of Fair Value Measurements on a Recurring Basis In millions	Dec 31, 2021				Dec 31, 2020		
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Total
Assets at fair value:							
Cash equivalents:							
Held-to-maturity securities ¹	\$ —	\$ 317	\$ —	\$ 317	\$ —	\$ 980	\$ 980
Money market funds	—	489	—	489	—	484	484
Marketable securities ²	—	245	—	245	—	45	45
Equity securities ³	20	—	—	20	40	—	40
Debt securities: ³							
Government debt ⁴	—	735	—	735	—	698	698
Corporate bonds	44	1,280	—	1,324	28	908	936
Derivatives relating to: ⁵							
Interest rates	—	145	—	145	—	44	44
Foreign currency	—	165	—	165	—	113	113
Commodities	15	307	—	322	8	173	181
Total assets at fair value	\$ 79	\$ 3,683	\$ —	\$ 3,762	\$ 76	\$ 3,445	\$ 3,521
Liabilities at fair value:							
Long-term debt including debt due within one year ⁶	\$ —	\$ 17,125	\$ —	\$ 17,125	\$ —	\$ 20,604	\$ 20,604
Guarantee liability ⁷	—	—	220	220	—	—	—
Derivatives relating to: ⁵							
Interest rates	—	284	—	284	—	185	185
Foreign currency	—	137	—	137	—	128	128
Commodities	37	257	—	294	7	201	208
Total liabilities at fair value	\$ 37	\$ 17,803	\$ 220	\$ 18,060	\$ 7	\$ 21,118	\$ 21,125

1. The Company's held-to-maturity securities primarily included treasury bills and time deposits.

2. The Company's investments in marketable securities are included in "Other current assets" in the consolidated balance sheets.

3. The Company's investments in debt securities, which are primarily available-for-sale, and equity securities are included in "Other investments" in the consolidated balance sheets.

4. U.S. Treasury obligations, U.S. agency obligations, U.S. agency mortgage-backed securities and other municipalities' obligations.

5. See Note 22 for the classification of derivatives in the consolidated balance sheets.

6. See Note 22 for information on fair value measurements of long-term debt.

7. Estimated liability for TDCC's guarantee of Sadara's debt which is included in "Other noncurrent obligations" in the consolidated balance sheets. See Note 16 for additional information.

For assets and liabilities classified as Level 1 measurements (measured using quoted prices in active markets), total fair value is either the price of the most recent trade at the time of the market close or the official close price, as defined by the exchange on which the asset is most actively traded on the last trading day of the period, multiplied by the number of units held without consideration of transaction costs.

For assets and liabilities classified as Level 2 measurements, where the security is frequently traded in less active markets, fair value is based on the closing price at the end of the period; where the security is less frequently traded, fair value is based on the price a dealer would pay for the security or similar securities, adjusted for any terms specific to that asset or liability, or by using observable market data points of similar, more liquid securities to imply the price. Market inputs are obtained from well-established and recognized vendors of market data and subjected to tolerance and quality checks.

For derivative assets and liabilities, standard industry models are used to calculate the fair value of the various financial instruments based on significant observable market inputs, such as foreign exchange rates, commodity prices, swap rates, interest rates and implied volatilities obtained from various market sources. Market inputs are obtained from well-established and recognized vendors of market data and subjected to tolerance/quality checks.

For all other assets and liabilities for which observable inputs are used, fair value is derived through the use of fair value models, such as a discounted cash flow model or other standard pricing models. See Note 22 for further information on the types of instruments used by the Company for risk management.

There were no transfers between Levels 1 and 2 in the years ended December 31, 2021 and 2020.

For liabilities classified as Level 3 measurements, the fair value is based on significant unobservable inputs including assumptions where there is little, if any, market activity. The fair value of the Company's accrued liability related to the guarantee of Sadara's debt is in proportion to the Company's 35 percent ownership interest in Sadara. The estimated fair value of the guarantee was calculated using a "with" and "without" method. The fair value of the debt was calculated "with" the guarantee less the fair value of the debt "without" the guarantee. The "with" and "without" values were calculated using a discounted cash flow method based on contractual cash flows as well as projected prepayments made on the debt by Sadara. See Note 16 for further information on guarantees classified as Level 3 measurements. The following table summarizes the changes in fair value measurements using Level 3 inputs for the year ended December 31, 2021:

Fair Value Measurements Using Level 3 Inputs for Accrued Liability of Sadara Guarantee at Dec 31,		
In millions		2021
Balance at Jan 1		\$ —
Recognition of liability ¹		(235)
Gain included in earnings ²		15
Balance at Dec 31		\$ (220)

1. Included in "Other noncurrent obligations" in the consolidated balance sheets.

2. Included in "Equity in earnings (losses) of nonconsolidated affiliates" in the consolidated income statements.

For equity securities calculated at net asset value per share (or its equivalent), the Company had \$106 million in private equity and \$22 million in real estate at December 31, 2021 (\$111 million in private equity and \$19 million in real estate at December 31, 2020). There are no redemption restrictions and the unfunded commitments on these investments were \$59 million at December 31, 2021 (\$63 million at December 31, 2020).

Fair Value Measurements on a Nonrecurring Basis

The following table summarizes the bases used to measure certain assets at fair value on a nonrecurring basis in the consolidated balance sheets in 2021, 2020 and 2019:

Basis of Fair Value Measurements on a Nonrecurring Basis at Dec 31		(Level 3)	Total Losses
In millions			
2020			
Assets at fair value:			
Long-lived assets and other assets	\$	121	\$ (245)
2019			
Assets at fair value:			
Long-lived assets, other assets and equity method investments	\$	162	\$ (2,031)
Goodwill	\$	—	\$ (1,039)

2021 Fair Value Measurements on a Nonrecurring Basis

The Company's fair value measurements on a nonrecurring basis were insignificant in 2021.

2020 Fair Value Measurements on a Nonrecurring Basis

As part of the 2020 Restructuring Program, the Company has or will shut down and write off several small manufacturing facilities and miscellaneous assets around the world. The assets associated with this plan were written down to zero. In addition, impairments of leased, non-manufacturing facilities, which were classified as Level 3 measurements, resulted in a write-down of right-of-use assets to a fair value of \$110 million using unobservable inputs. The impairment charges related to the 2020 Restructuring Program, totaling \$196 million, were included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Packaging & Specialty Plastics (\$11 million), Industrial Intermediates & Infrastructure (\$22 million), Performance Materials & Coatings (\$116 million) and Corporate (\$47 million).

In 2020, the Company recognized impairment charges of \$30 million related to the write-down of a non-manufacturing asset and certain corporate leased equipment and the write-off of a capital project. The assets, classified as Level 3 measurements, were valued at \$11 million using unobservable inputs. The impairment charges were included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Performance Materials & Coatings (\$15 million) and Corporate (\$15 million).

In 2020, the Company recognized an additional pretax impairment charge of \$19 million related to capital additions made to a bio-ethanol manufacturing facility in Santa Vitoria, Minas Gerais, Brazil, which was impaired in 2017. The assets were written down to zero in 2020. The impairment charge was included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Packaging & Specialty Plastics. On September 29, 2020, the Company divested the bio-ethanol manufacturing facility. See Note 6 for additional information.

2019 Fair Value Measurements on a Nonrecurring Basis

As part of the Synergy Program, the Company has or will shut down and write-off several small manufacturing facilities, non-manufacturing assets and certain corporate facilities around the world. In 2019, manufacturing facilities associated with this plan were written down to zero. In addition, impairments of leased, non-manufacturing facilities, which were classified as Level 3 measurements, resulted in a write-down of right-of-use assets to a fair value of \$152 million using unobservable inputs. The impairment charges related to the Synergy Program, totaling \$143 million, were included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Industrial Intermediates & Infrastructure (\$2 million), Performance Materials & Coatings (\$28 million) and Corporate (\$113 million).

In 2019, the Company recognized an additional pretax impairment charge of \$44 million related to capital additions made to Santa Vitoria, which was impaired in 2017. The assets were written down to zero in 2019. The impairment charge was included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Packaging & Specialty Plastics.

In 2019, the Company recognized impairment charges of \$14 million related to non-manufacturing assets. The assets, classified as Level 3 measurements, were valued at \$10 million using unobservable inputs. The impairment charges were included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Performance Materials & Coatings (\$9 million) and Corporate (\$5 million).

In 2019, the Company recognized an impairment charge of \$75 million resulting from the planned divestiture of its acetone derivatives business to ALTIVIA Ketones & Additives, LLC. The transaction closed on November 1, 2019 and included the Company's acetone derivatives related inventory and production assets, located in Institute, West Virginia, in addition to the site infrastructure, land and utilities. The assets, classified as Level 3 measurements and valued using unobservable inputs, were written down to zero in 2019, except for inventory, which was sold at the lower of cost or market. The impairment charge was included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Packaging & Specialty Plastics (\$24 million) and Corporate (\$51 million).

In the fourth quarter of 2019, the Company performed its annual goodwill impairment testing utilizing a discounted cash flow methodology as its valuation technique. As a result, the Company determined the fair value of the C&PM reporting unit was lower than its carrying amount and recorded an impairment charge of \$1,039 million, included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Performance Materials & Coatings. See Note 13 for additional information on the impairment charge.

In the fourth quarter of 2019, the Company concluded that its equity method investment in Sadara, classified as a Level 3 measurement and valued using unobservable inputs, was other-than-temporarily impaired and written down to zero. Additionally, the Company reserved certain accounts and notes receivable and accrued interest balances due to uncertainty on the timing of collection. As a result, the Company recorded a \$1,755 million charge related to Sadara. The charge was included in "Restructuring, goodwill impairment and asset related charges - net" in the consolidated statements of income and related to Packaging & Specialty Plastics (\$370 million), Industrial Intermediates & Infrastructure (\$1,168 million) and Corporate (\$217 million). See Note 12 for additional information.

See Note 6 for additional information on the Company's restructuring activities.

NOTE 24 – VARIABLE INTEREST ENTITIES

Consolidated Variable Interest Entities ("VIEs")

The Company holds a variable interest in the following joint ventures or entities for which it is the primary beneficiary:

Asia Pacific Joint Ventures

The Company has variable interests in two joint ventures that own and operate manufacturing and logistics facilities, which produce chemicals and provide services in Asia Pacific. The Company's variable interests in these joint ventures relate to arrangements between the joint ventures and the Company, involving the majority of the output on take-or-pay terms with pricing ensuring a guaranteed return to the joint ventures.

The Company was a 50 percent indirect owner in a propylene oxide ("PO") manufacturing joint venture in Asia Pacific. The Company had a variable interest in this joint venture relating to arrangements between the joint venture and the Company involving the majority of the output on take-or-pay terms, with pricing ensuring a guaranteed return to the joint venture. On April 30, 2019, the Company executed an agreement to acquire full ownership in the PO manufacturing joint venture. The transaction closed on October 1, 2019, for a cash purchase price of \$331 million. Approximately half of the purchase price was attributed to the Company's proportionate equity interest in the entity that owned the PO manufacturing joint venture, which was accounted for under the equity method of accounting, and was classified as "Investments in and loans to nonconsolidated affiliates" in the consolidated statements of cash flows. The remaining \$166 million was classified as "Purchases of noncontrolling interests" in the consolidated statements of cash flows.

Ethylene Storage Joint Venture

The Company has variable interests in a joint venture that provides ethylene storage in Alberta, Canada. The Company's variable interests relate to arrangements involving a majority of the joint venture's storage capacity on take-or-pay terms with pricing ensuring a guaranteed return to the joint venture; and favorably priced leases provided to the joint venture. The Company provides the joint venture with operation and maintenance services and utilities.

Assets and Liabilities of Consolidated VIEs

The Company's consolidated financial statements include the assets, liabilities and results of operations of VIEs for which the Company is the primary beneficiary. The other equity holders' interests are reflected in "Net income attributable to noncontrolling interests" in the consolidated statements of income and "Noncontrolling interests" in the consolidated balance sheets.

The following table summarizes the carrying amounts of these entities' assets and liabilities included in the Company's consolidated balance sheets at December 31, 2021 and 2020:

Assets and Liabilities of Consolidated VIEs at Dec 31		2021	2020
In millions			
Cash and cash equivalents	\$	40	\$ 26
Other current assets		40	44
Net property		184	232
Other noncurrent assets		15	17
Total assets ¹	\$	279	\$ 319
Current liabilities	\$	37	\$ 73
Long-term debt		3	6
Other noncurrent obligations		13	18
Total liabilities ²	\$	53	\$ 97

1. All assets were restricted at December 31, 2021 and 2020.

2. All liabilities were nonrecourse at December 31, 2021 and 2020.

Amounts presented in the consolidated balance sheets and the table above as restricted assets or nonrecourse obligations relating to consolidated VIEs at December 31, 2021 and 2020 are adjusted for intercompany eliminations.

Nonconsolidated VIEs

The Company holds a variable interest in the following entities for which the Company is not the primary beneficiary:

Silicon Joint Ventures

The Company holds minority voting interests in certain joint ventures that produce silicon inputs for the Company. These joint ventures operate under supply agreements that sell inventory to the equity owners using pricing mechanisms that guarantee a return, therefore shielding the joint ventures from the obligation to absorb expected losses. As a result of the pricing mechanisms of these agreements, these entities are determined to be VIEs. The Company is not the primary beneficiary, as it does not hold the power to direct the activities that most significantly impact the economic performance of these entities; therefore, the entities are accounted for under the equity method of accounting. The Company's maximum exposure to loss as a result of its involvement with these variable interest entities is determined to be the carrying value of the investment in these entities. At December 31, 2021, the Company's investment in these joint ventures was \$110 million (\$107 million at December 31, 2020), classified as "Investment in nonconsolidated affiliates" in the consolidated balance sheets, representing the Company's maximum exposure to loss.

NOTE 25 – RELATED PARTY TRANSACTIONS

Effective with the separation from DowDuPont on April 1, 2019, TDCC became a wholly owned subsidiary of Dow Inc. and reported transactions with Dow Inc. as related party transactions. From the Merger Date through March 31, 2019, TDCC reported transactions with DowDuPont and Historical DuPont and its affiliates as related party transactions.

TDCC

TDCC has committed to fund Dow Inc.'s dividends paid to common stockholders and share repurchases, as approved by Dow Inc.'s Board from time to time, as well as certain governance expenses. Funding is accomplished through intercompany loans. TDCC's Board reviews and determines a dividend distribution to Dow Inc. to settle the intercompany loans. The following table summarizes cash dividends TDCC declared and paid to Dow Inc. for the years ended 2021, 2020 and 2019.

TDCC Cash Dividends Declared and Paid		2021	2020	2019
In millions				
Cash dividends declared and paid	\$	3,264	\$ 2,233	\$ 201

At December 31, 2021 and 2020, TDCC's intercompany loan balance with Dow Inc. was insignificant.

DowDuPont

Pursuant to the Agreement and Plan of Merger, dated as of December 11, 2015, as amended on March 31, 2017, and prior to the separation from DowDuPont, TDCC committed to fund a portion of DowDuPont's dividends paid to common stockholders and certain governance expenses. In 2019, TDCC declared and paid dividends to DowDuPont of \$535 million.

Historical DuPont and its Affiliates

Prior to the separation from DowDuPont, TDCC sold to and procured from Historical DuPont and its affiliates certain raw materials that were consumed in each company's manufacturing process. The following table presents revenue earned and expenses incurred related to transactions with Historical DuPont and its affiliates:

Sales to Historical DuPont and its Affiliates	
In millions	2019
Net sales	\$ 12
Cost of sales	\$ 9

Purchases from Historical DuPont and its affiliates were insignificant for 2019.

NOTE 26 – SEGMENTS AND GEOGRAPHIC REGIONS

Dow combines global breadth; asset integration and scale; focused innovation and materials science expertise; leading business positions; and environmental, social and governance (ESG) leadership to achieve profitable growth and deliver a sustainable future. The Company's ambition is to become the most innovative, customer centric, inclusive and sustainable materials science company in the world. Dow's portfolio of plastics, industrial intermediates, coatings and silicones businesses delivers a broad range of differentiated, science-based products and solutions for its customers in high-growth market segments, such as packaging, infrastructure, mobility and consumer applications. Dow operates 104 manufacturing sites in 31 countries and employs approximately 35,700 people.

The Company conducts its worldwide operations through six global businesses which are organized into the following operating segments: Packaging & Specialty Plastics, Industrial Intermediates & Infrastructure and Performance Materials & Coatings. Corporate contains the reconciliation between the totals for the operating segments and the Company's totals. The Company did not aggregate any operating segments when determining its reportable segments. The Company reports geographic information for the following regions: U.S. & Canada, Asia Pacific, Latin America and EMEA. The Company transfers ethylene to its downstream derivative businesses at market prices. The Company also allocated costs previously assigned to AgCo and SpecCo ("stranded costs") to the operating segments.

Dow's measure of profit/loss for segment reporting purposes is Operating EBIT (for the years ended December 31, 2021 and 2020) and pro forma Operating EBIT (for the year ended December 31, 2019) as this is the manner in which the Company's chief operating decision maker ("CODM") assesses performance and allocates resources. The Company defines Operating EBIT as earnings (i.e., "Income (loss) from continuing operations before income taxes") before interest, excluding the impact of significant items. The Company defines pro forma Operating EBIT as earnings (i.e., "Income (loss) from continuing operations before income taxes") before interest, plus pro forma adjustments, excluding the impact of significant items. Operating EBIT and pro forma Operating EBIT by segment include all operating items relating to the businesses; items that principally apply to Dow as a whole are assigned to Corporate. The Company also presents pro forma net sales for the year ended December 31, 2019 in this footnote as it is included in management's measure of segment performance and is regularly reviewed by the CODM. Pro forma net sales includes the impact of various manufacturing, supply and service related agreements entered into with DuPont and Corteva in connection with the separation which provide for different pricing than the historical intercompany and intracompany pricing practices of TDCC and Historical DuPont.

Corporate Profile

Dow conducts its worldwide operations through global businesses which are reflected in the following reportable segments:

Packaging & Specialty Plastics

The Packaging & Specialty Plastics operating segment consists of two highly integrated global businesses: Hydrocarbons & Energy and Packaging and Specialty Plastics. The segment employs the industry's broadest polyolefin product portfolio, supported by the Company's proprietary catalyst and manufacturing process technologies. These differentiators, plus collaboration at the customer's design table, enable the segment to deliver more reliable, durable, higher-performing solutions designed for recyclability and enhanced plastics circularity and sustainability. The segment serves customers, brand owners and ultimately consumers in key markets including food and specialty packaging; industrial and consumer packaging; health and hygiene; caps, closures and pipe applications; consumer durables; mobility and transportation; and infrastructure. This segment includes the results of The Kuwait Styrene Company K.S.C.C. and The SCG-Dow Group, as well as a portion of the results of EQUATE, The Kuwait Olefins Company K.S.C.C. ("TKOC"), Map Ta Phut and Sadara, all joint ventures of the Company.

Industrial Intermediates & Infrastructure

The Industrial Intermediates & Infrastructure operating segment consists of two customer-centric global businesses - Industrial Solutions and Polyurethanes & Construction Chemicals - that develop important intermediate chemicals that are essential to manufacturing processes, as well as downstream, customized materials and formulations that use advanced development technologies. These businesses primarily produce and market ethylene oxide and propylene oxide derivatives that are aligned to market segments as diverse as appliances, coatings, electronics, surfactants for cleaning and sanitization, infrastructure and oil and gas. The businesses' global scale and reach, world-class technology, research and development capabilities and materials science expertise enable the Company to be a premier solutions provider offering customers value-add sustainable solutions to enhance comfort, energy efficiency, product effectiveness and durability across a wide range of home comfort and appliance, building and construction, mobility and transportation, adhesive and lubricant applications, among others. This segment includes a portion of the Company's share of the results of EQUATE, TKOC, Map Ta Phut and Sadara.

Performance Materials & Coatings

The Performance Materials & Coatings operating segment includes industry-leading franchises that deliver a wide array of solutions into consumer, infrastructure and mobility end-markets. The segment consists of two global businesses: Coatings & Performance Monomers and Consumer Solutions. These businesses primarily utilize the Company's acrylics-, cellulose- and silicone-based technology platforms to serve the needs of the architectural and industrial coatings; home care and personal care; consumer and electronics; mobility and transportation; industrial and chemical processing; and building and infrastructure end-markets. Both businesses employ materials science capabilities, global reach and unique products and technology to combine chemistry platforms to deliver differentiated, market-driven and sustainable innovations to customers.

Corporate

Corporate includes certain enterprise and governance activities (including insurance operations, environmental operations, etc.); non-business aligned joint ventures; non-business aligned litigation expenses; and discontinued or non-aligned businesses.

Sales are attributed to geographic region based on customer location; long-lived assets are attributed to geographic region based on asset location.

Geographic Region Information	<i>United States</i>	<i>EMEA</i>	<i>Rest of World</i>	<i>Total</i>
In millions				
2021				
Sales to external customers	\$ 18,083	\$ 19,746	\$ 17,139	\$ 54,968
Long-lived assets	\$ 14,425	\$ 2,703	\$ 3,427	\$ 20,555
2020				
Sales to external customers	\$ 12,547	\$ 12,969	\$ 13,026	\$ 38,542
Long-lived assets	\$ 13,833	\$ 2,813	\$ 3,593	\$ 20,239
2019				
Sales to external customers	\$ 14,437	\$ 14,612	\$ 13,902	\$ 42,951
Long-lived assets	\$ 14,571	\$ 2,649	\$ 3,776	\$ 20,996

Segment Information	<i>Pack. & Spec. Plastics</i>	<i>Ind. Interm. & Infrac.</i>	<i>Perf. Materials & Coatings</i>	<i>Corp.</i>	<i>Total</i>
In millions					
2021					
Net sales	\$ 28,128	\$ 16,851	\$ 9,672	\$ 317	\$ 54,968
Restructuring and asset related charges (credits) - net ¹	8	1	10	(13)	6
Equity in earnings of nonconsolidated affiliates	490	471	7	7	975
Operating EBIT ²	6,638	2,282	866	(253)	9,533
Depreciation and amortization	1,358	612	842	30	2,842
Total assets	30,556	13,750	13,810	4,874	62,990
Investments in nonconsolidated affiliates	1,230	670	111	34	2,045
Capital expenditures	808	359	334	—	1,501
2020					
Net sales	\$ 18,301	\$ 12,021	\$ 7,951	\$ 269	\$ 38,542
Restructuring and asset related charges - net ¹	30	22	192	464	708
Equity in earnings (losses) of nonconsolidated affiliates	173	(166)	6	(31)	(18)
Operating EBIT ²	2,325	355	314	(279)	2,715
Depreciation and amortization	1,372	605	870	27	2,874
Total assets	30,069	12,220	13,915	5,266	61,470
Investments in nonconsolidated affiliates	661	531	108	27	1,327
Capital expenditures	678	268	306	—	1,252
2019					
Net sales	\$ 20,245	\$ 13,440	\$ 8,923	\$ 343	\$ 42,951
Pro forma net sales	20,245	13,449	8,961	343	42,998
Restructuring, goodwill impairment and asset related charges - net ¹	439	1,175	1,076	529	3,219
Equity in earnings (losses) of nonconsolidated affiliates	162	(241)	5	(20)	(94)
Pro forma Operating EBIT ³	2,904	845	918	(315)	4,352
Depreciation and amortization	1,435	594	877	32	2,938
Total assets	29,522	11,753	14,059	5,190	60,524
Investments in nonconsolidated affiliates	675	568	101	60	1,404
Capital expenditures	1,039	452	470	—	1,961

1. See Note 6 for information regarding the Company's restructuring programs, goodwill impairment and other asset related charges.

2. Operating EBIT for TDCC in 2021 and 2020 is substantially the same as that of Dow Inc. and therefore is not disclosed separately in the table above. A reconciliation of "Income from continuing operations, net of tax" to Operating EBIT is provided on the following page.

3. Pro forma Operating EBIT for TDCC in 2019 is substantially the same as that of Dow Inc. and therefore is not disclosed separately in the table above. A reconciliation of "Income (loss) from continuing operations, net of tax" to pro forma Operating EBIT is provided on the following page.

Reconciliation of "Income from continuing operations, net of tax" to Operating EBIT		
In millions	2021	2020
Income from continuing operations, net of tax	\$ 6,405	\$ 1,294
+ Provision for income taxes on continuing operations	1,740	777
Income from continuing operations before income taxes	\$ 8,145	\$ 2,071
- Interest income	55	38
+ Interest expense and amortization of debt discount	731	827
- Significant items	(712)	145
Operating EBIT	\$ 9,533	\$ 2,715

Reconciliation of "Income (loss) from continuing operations, net of tax" to Pro Forma Operating EBIT	
In millions	2019
Income (loss) from continuing operations, net of tax	\$ (1,717)
+ Provision for income taxes on continuing operations	470
Income (loss) from continuing operations before income taxes	\$ (1,247)
- Interest income	81
+ Interest expense and amortization of debt discount	933
+ Pro forma adjustments ¹	65
- Significant items	(4,682)
Pro forma Operating EBIT	\$ 4,352

1. Pro forma adjustments include: (1) the margin impact of various manufacturing, supply and service related agreements entered into with DuPont and Corteva in connection with the separation which provide for different pricing than the historical intercompany and intracompany pricing practices of TDCC and Historical DuPont, (2) the removal of the amortization of ECP's inventory step-up recognized in connection with the Merger and (3) the elimination of the impact of events directly attributable to the Merger, internal reorganization and business realignment, separation, distribution and other related transactions (e.g., one-time transaction costs).

The following tables summarize the pretax impact of significant items by segment that are excluded from Operating EBIT and pro forma Operating EBIT:

Significant Items by Segment for 2021					
In millions	<i>Pack. & Spec. Plastics</i>	<i>Ind. Inter. & Infrac.</i>	<i>Perf. Materials & Coatings</i>	<i>Corp.</i>	<i>Total</i>
Digitalization program costs ¹	\$ —	\$ —	\$ —	\$ (169)	\$ (169)
Restructuring, implementation costs and asset related charges - net ²	(8)	(1)	(10)	(50)	(69)
Loss on early extinguishment of debt ³	—	—	—	(574)	(574)
Net gain on divestitures and asset sale ⁴	16	—	—	—	16
Litigation related charges, awards and adjustments ⁵	—	54	—	—	54
Indemnification and other transaction related costs ⁶	—	—	—	30	30
Total	\$ 8	\$ 53	\$ (10)	\$ (763)	\$ (712)

1. Includes costs associated with implementing the Company's digital acceleration program.

2. Includes Board approved restructuring plans, including costs associated with implementing the Company's 2020 Restructuring Program, and asset-related charges, which include other asset impairments. See Note 6 for additional information.

3. The Company redeemed outstanding long-term debt resulting in a loss on early extinguishment. See Note 15 for additional information.

4. Includes post-closing adjustments on a previous divestiture.

5. Related to an arbitration award received from Luxi Chemical Group Co., Ltd. See Note 16 for additional information.

6. Primarily related to charges associated with agreements entered into with DuPont and Corteva as part of the separation and distribution which, among other matters, provides for cross-indemnities and allocations of obligations and liabilities for periods prior to, at and after the completion of the separation. See Note 3 for additional information.

Significant Items by Segment for 2020	<i>Pack. & Spec. Plastics</i>	<i>Ind. Inter. & Infrac.</i>	<i>Perf. Materials & Coatings</i>	<i>Corp.</i>	<i>Total</i>
In millions					
Integration and separation costs ¹	\$ —	\$ —	\$ —	\$ (239)	\$ (239)
Restructuring, implementation costs and asset related charges - net ²	(30)	(22)	(192)	(474)	(718)
Warranty accrual adjustment of exited business ³	—	—	—	11	11
Net gain on divestitures and asset sale ⁴	52	61	—	604	717
Litigation related charges, awards and adjustments ⁵	544	—	—	—	544
Loss on early extinguishment of debt ⁶	—	—	—	(149)	(149)
Indemnification and other transaction related costs ⁷	—	—	—	(21)	(21)
Total	\$ 566	\$ 39	\$ (192)	\$ (268)	\$ 145

1. Costs related to business separation activities.
2. Includes Board approved restructuring plans, including costs associated with implementing the Company's 2020 Restructuring Program, and asset-related charges, which include other asset impairments. See Note 6 for additional information.
3. Includes an adjustment to the warranty accrual of an exited business.
4. Primarily related to a gain on the sale of rail infrastructure in the U.S. and Canada and a gain on the sale of marine and terminal operations and assets in the U.S. See Notes 5 and 7 for additional information.
5. Includes recognition of gains associated with a legal matter with Nova. See Note 16 for additional information.
6. The Company retired outstanding long-term debt resulting in a loss on early extinguishment. See Note 15 for additional information.
7. Primarily related to charges associated with agreements entered into with DuPont and Corteva as part of the separation and distribution which, among other matters, provides for cross-indemnities and allocations of obligations and liabilities for periods prior to, at and after the completion of the separation. See Note 3 for additional information.

Significant Items by Segment for 2019	<i>Pack. & Spec. Plastics</i>	<i>Ind. Inter. & Infrac.</i>	<i>Perf. Materials & Coatings</i>	<i>Corp.</i>	<i>Total</i>
In millions					
Integration and separation costs ¹	\$ —	\$ —	\$ —	\$ (1,013)	\$ (1,013)
Restructuring, goodwill impairment and asset related charges - net ²	(439)	(1,175)	(1,076)	(529)	(3,219)
Warranty accrual adjustment of exited business ³	—	—	—	39	39
Environmental charges ⁴	(5)	(8)	(50)	(336)	(399)
Loss on divestitures ⁵	—	(5)	—	(44)	(49)
Loss on early extinguishment of debt ⁶	—	—	—	(102)	(102)
Litigation related charges, awards and adjustments ⁷	170	—	—	35	205
Indemnification and other transaction related costs ⁸	—	—	—	(144)	(144)
Total	\$ (274)	\$ (1,188)	\$ (1,126)	\$ (2,094)	\$ (4,682)

1. Costs related to post-Merger integration and business separation activities. Excludes one-time transaction costs directly attributable to the Merger.
2. Includes Board approved restructuring plans and asset related charges (see Note 6 for additional information); a charge related to Sadara (see Note 12 for additional information) and an impairment charge related to goodwill associated with the Coatings & Performance Monomers reporting unit (see Note 13 for additional information).
3. Includes an adjustment to the warranty accrual of an exited business.
4. Related to environmental remediation, primarily resulting from the culmination of long-standing negotiations with regulators and/or agencies and review of additional costs to manage ongoing remediation activities resulting from Dow's separation from DowDuPont and related agreements with Corteva and DuPont. See Note 16 for additional information.
5. Includes post-closing adjustments on previous divestitures.
6. The Company retired outstanding long-term debt resulting in a loss on early extinguishment. See Note 15 for additional information.
7. Includes a gain associated with a legal matter with Nova, as well as a gain related to an adjustment of the Implant Liability and a charge related to the settlement of the Commercial Creditor matters. See Note 16 for additional information.
8. Includes charges primarily associated with agreements entered into with DuPont and Corteva as part of the separation and distribution which, among other matters, provides for cross-indemnities and allocations of obligations and liabilities for periods prior to, at and after the completion of the separation.

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

Not applicable.

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, Dow Inc. and The Dow Chemical Company (the "Companies") carried out an evaluation, under the supervision and with the participation of the Companies' Disclosure Committee and the Companies' management, including the Chief Executive Officer and the Chief Financial Officer, of the effectiveness of the design and operation of the Companies' disclosure controls and procedures pursuant to paragraph (b) of Exchange Act Rules 13a-15 and 15d-15. Based upon that evaluation, the Chief Executive Officer and the Chief Financial Officer concluded that the Companies' disclosure controls and procedures were effective.

Changes in Internal Control Over Financial Reporting

There were no changes in the Companies' internal control over financial reporting identified in connection with the evaluation required by paragraph (d) of Exchange Act Rules 13a-15 and 15d-15 that was conducted during the last fiscal quarter that have materially affected, or are reasonably likely to materially affect, the Companies' internal control over financial reporting.

Management's Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting. The Companies' internal control framework and processes are designed to provide reasonable assurance to management and the Board of Directors regarding the reliability of financial reporting and the preparation of the Companies' consolidated financial statements in accordance with accounting principles generally accepted in the United States of America.

The Companies' internal control over financial reporting includes those policies and procedures that:

- pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Companies;
- 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 Companies are being made only in accordance with authorizations of management and Directors of the Companies; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Companies' assets that could have a material effect on the consolidated financial statements.

Because of its inherent limitations, any system of internal control over financial reporting can provide only reasonable assurance and may not prevent or detect misstatements.

Management assessed the effectiveness of the Companies' internal control over financial reporting and concluded that, as of December 31, 2021, such internal control is effective. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in *Internal Control—Integrated Framework (2013)*.

The Companies' independent auditors, Deloitte & Touche LLP, with direct access to the Companies' Board of Directors through the Audit Committee of Dow Inc., have audited the consolidated financial statements prepared by the Companies. Their reports on the consolidated financial statements are included in Part II, Item 8. Financial Statements and Supplementary Data. Deloitte & Touche LLP's reports on the Companies' internal control over financial reporting are referenced therein and included herein.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Dow Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Dow Inc. and subsidiaries (the “Company”) 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 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 COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2021, of the Company and the financial statement schedule listed in the Index at Item 15(a)2 and our report dated February 4, 2022, expressed an unqualified opinion on those financial statements and financial statement schedule.

Basis for Opinion

The Company’s management is responsible 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 an opinion on the Company’s internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

/s/ DELOITTE & TOUCHE LLP

Midland, Michigan

February 4, 2022

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholder and the Board of Directors of The Dow Chemical Company

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of The Dow Chemical Company and subsidiaries (the "Company") 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 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 COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2021, of the Company and the financial statement schedule listed in the Index at Item 15(a)2 and our report dated February 4, 2022, expressed an unqualified opinion on those financial statements and financial statement schedule.

Basis for Opinion

The Company's management is responsible 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 an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

/s/ DELOITTE & TOUCHE LLP

Midland, Michigan

February 4, 2022

ITEM 9B. OTHER INFORMATION

None.

Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries
PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Information relating to Directors, certain executive officers and certain corporate governance matters (including identification of Audit Committee members and financial expert(s)) is contained in the definitive Proxy Statement for the 2022 Annual Meeting of Stockholders of Dow Inc. and is incorporated herein by reference. See also the information regarding executive officers of the registrant set forth in Part I, Item 1. Business under the caption "Executive Officers of the Registrant" in reliance on General Instruction G to Form 10-K.

This information is omitted for The Dow Chemical Company pursuant to General Instruction I of Form 10-K.

ITEM 11. EXECUTIVE COMPENSATION

Information relating to executive compensation and the Company's equity compensation plans is contained in the definitive Proxy Statement for the 2022 Annual Meeting of Stockholders of Dow Inc. and is incorporated herein by reference.

This information is omitted for The Dow Chemical Company pursuant to General Instruction I of Form 10-K.

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

Information with respect to beneficial ownership of Dow Inc. common stock by each Director and all Directors and executive officers of the Company as a group is contained in the definitive Proxy Statement for the 2022 Annual Meeting of Stockholders of Dow Inc. and is incorporated herein by reference.

Information relating to any person who beneficially owns in excess of 5 percent of the total outstanding shares of Dow Inc. common stock is contained in the definitive Proxy Statement for the 2022 Annual Meeting of the Stockholders of Dow Inc. and is incorporated herein by reference.

Information with respect to compensation plans under which equity securities are authorized for issuance is contained in the definitive Proxy Statement for the 2022 Annual Meeting of Stockholders of Dow Inc. and is incorporated herein by reference.

This information is omitted for The Dow Chemical Company pursuant to General Instruction I of Form 10-K.

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

Reportable relationships and related transactions, if any, as well as information relating to director independence are contained in the definitive Proxy Statement for the 2022 Annual Meeting of Stockholders of Dow Inc. and are incorporated herein by reference.

This information is omitted for The Dow Chemical Company pursuant to General Instruction I of Form 10-K.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES**Independent Registered Public Accountants**

Information with respect to fees and services related to the Company's independent auditors, Deloitte & Touche LLP ("Deloitte"), and the disclosure of the Audit Committee's pre-approval policies and procedures are contained in the definitive Proxy Statement for the 2022 Annual Meeting of Stockholders of Dow Inc. and are incorporated herein by reference.

The Audit Committee of Dow Inc. carefully considers the qualifications and competence of candidates for the independent registered public accounting firm. In accordance with its pre-approval policies and procedures, the Audit Committee pre-approved all professional services rendered by and associated fees paid to Deloitte, for the Companies, for the years ended December 31, 2021 and 2020. Professional services were performed by Deloitte, its member firms of Deloitte Touche Tohmatsu Limited, and their respective affiliates ("Deloitte Entities"). Total fees paid to the Deloitte Entities are shown by category in the following table:

Type of Fees		
In thousands	2021	2020
Audit Fees ¹	\$ 20,529	\$ 21,237
Audit-Related Fees ²	1,309	2,807
Tax Fees ³	628	2,053
Total	\$ 22,466	\$ 26,097

1. The aggregate fees billed primarily for the integrated audit of the Company's annual financial statements and internal control over financial reporting, the reviews of the financial statements in quarterly reports on Form 10-Q, comfort letters, consents, statutory audits, and other regulatory filings.

2. The aggregate fees billed primarily for audits of assessment of controls relating to the services audit report, services for sustainability reporting, and agreed-upon procedures engagements.

3. The aggregate fees billed primarily for corporate tax consulting and tax compliance services.

- 4.1 [Indenture, dated as of April 1, 1992 \(the "1992 Indenture"\), between The Dow Chemical Company and the First National Bank of Chicago, as trustee \(incorporated by reference to Exhibit 4.1 to The Dow Chemical Company's Registration Statement on Form S-3, File No. 333-88617, filed with the SEC on October 8, 1999 \(the "S-3 Registration Statement"\)\)](#).
- 4.1.1 [Supplemental Indenture, dated as of January 1, 1994, between The Dow Chemical Company and The First National Bank of Chicago, as trustee, to the 1992 Indenture \(incorporated by reference to Exhibit 4.2 to the S-3 Registration Statement\)](#).
- 4.1.2 [Second Supplemental Indenture, dated as of October 1, 1999, between The Dow Chemical Company and Bank One Trust Company, N.A. \(formerly The First National Bank of Chicago\), as trustee, to the 1992 Indenture \(incorporated by reference to Exhibit 4.3 to the S-3 Registration Statement\)](#).
- 4.1.3 [Third Supplemental Indenture, dated as of May 15, 2001, between The Dow Chemical Company and Bank One Trust Company, N.A. \(formerly The First National Bank of Chicago\), as trustee, to the 1992 Indenture \(incorporated by reference to Exhibit 4.4 to The Dow Chemical Company's Registration Statement on Form S-4, File No. 333-67368 filed with the SEC on August 13, 2001\)](#).
- 4.2 [Indenture, dated May 1, 2008 \(the "2008 Indenture"\), between The Dow Chemical Company and The Bank of New York Trust Company, N.A., as trustee, \(incorporated by reference to Exhibit 4.1 to Post-Effective Amendment No. 1 to The Dow Chemical Company's Registration Statement on Form S-3, File No. 333-140859, filed with the SEC on May 6, 2008\)](#).
- 4.2.1 [First Supplemental Indenture, dated November 30, 2018, between The Dow Chemical Company, Dow Inc. \(formerly known as Dow Holdings Inc.\), and The Bank of New York Mellon Trust Company, N.A., as trustee, to the 2008 Indenture \(incorporated by reference to Exhibit 4.1 to The Dow Chemical Company's Current Report on Form 8-K filed with the SEC on December 3, 2018\)](#).
- 4.2.2 [Second Supplemental Indenture, dated May 20, 2019, between The Dow Chemical Company, Dow Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee, to the 2008 Indenture \(incorporated by reference to Exhibit 4.1 to The Dow Chemical Company's Current Report on Form 8-K filed with the SEC on May 20, 2019\)](#).
- 4.3 [Indenture, dated July 26, 2019 \(the "2019 Indenture"\), between The Dow Chemical Company and The Bank of New York Trust Company, N.A., as trustee \(incorporated by reference to Exhibit 4.3 to Dow Inc. and The Dow Chemical Company's Annual Report on Form 10-K filed with the SEC on February 7, 2020\)](#).
- 4.4 Dow Inc. agrees to provide the SEC, on request, copies of all other such indentures and instruments that define the rights of holders of long-term debt of Dow Inc. and its consolidated subsidiaries, including The Dow Chemical Company, pursuant to Item 601(b)(4)(iii)(A) of Regulation S-K.
- 4.5 [Description of Securities registered under Section 12 of the Securities Exchange Act of 1934 \(incorporated by reference to Exhibit 4.5 to Dow Inc. and The Dow Chemical Company's Current Report on Form 8-K filed with the SEC on February 3, 2022\)](#).
- 10.1 [Tax Matters Agreement, effective as of April 1, 2019, by and among Dow Inc., DuPont de Nemours, Inc. \(formerly known as DowDuPont Inc.\), and Corteva Inc. \(incorporated by reference to Exhibit 10.1 to Dow Inc.'s Current Report on Form 8-K filed with the SEC on April 2, 2019\)](#).
- 10.2 [Employee Matters Agreement, effective as of April 1, 2019, by and among Dow Inc., DuPont de Nemours, Inc. \(formerly known as DowDuPont Inc.\), and Corteva, Inc. \(incorporated by reference to Exhibit 10.2 to Dow Inc.'s Current Report on Form 8-K filed with the SEC on April 2, 2019\)](#).

- 10.3 [Intellectual Property Cross-License Agreement, effective as of April 1, 2019, by and among Dow Inc. and DuPont de Nemours, Inc. \(formerly known as DowDuPont Inc.\) \(incorporated by reference to Exhibit 10.3 to Dow Inc.'s Current Report on Form 8-K filed with the SEC on April 2, 2019\).](#)
- 10.4 [Intellectual Property Cross-License Agreement, dated as of April 1, 2019, by and among Dow Inc. and Corteva, Inc. \(incorporated by reference to Exhibit 10.4 to Dow Inc.'s Current Report on Form 8-K filed with the SEC on April 2, 2019\).](#)
- 10.5 [Dow Inc. 2019 Stock Incentive Plan effective as of April 1, 2019 \(incorporated by reference to Exhibit 4.4 to Dow Inc.'s Registration Statement on Form S-3 filed with the SEC on April 1, 2019\).](#)
- 10.5.1 [Form of Performance Stock Unit Award Agreement under the Dow Inc. 2019 Stock Incentive Plan effective as of April 1, 2019 \(incorporated by reference to Exhibit 4.4.1 to Dow Inc.'s Registration Statement on Form S-3 filed with the SEC on April 1, 2019\).](#)
- 10.5.2 [Form of Restricted Stock Award Agreement under the Dow Inc. 2019 Stock Incentive Plan effective as of April 1, 2019 \(incorporated by reference to Exhibit 4.4.2 to Dow Inc.'s Registration Statement on Form S-3 filed with the SEC on April 1, 2019\).](#)
- 10.5.3 [Form of Restricted Stock Unit Award Agreement under the Dow Inc. 2019 Stock Incentive Plan effective as of April 1, 2019 \(incorporated by reference to Exhibit 4.4.3 to Dow Inc.'s Registration Statement on Form S-3 filed with the SEC on April 1, 2019\).](#)
- 10.5.4 [Form of Stock Appreciation Right Award Agreement under the Dow Inc. 2019 Stock Incentive Plan effective as of April 1, 2019 \(incorporated by reference to Exhibit 4.4.4 to Dow Inc.'s Registration Statement on Form S-3 filed with the SEC on April 1, 2019\).](#)
- 10.5.5 [Form of Stock Option Award Agreement under the Dow Inc. 2019 Stock Incentive Plan effective as of April 1, 2019 \(incorporated by reference to Exhibit 4.4.5 to Dow Inc.'s Registration Statement on Form S-3 filed with the SEC on April 1, 2019\).](#)
- 10.5.6 [Form of Restricted Stock Unit Award Agreement \(Director\) under the Dow Inc. 2019 Stock Incentive Plan effective as of April 1, 2019 \(incorporated by reference to Exhibit 4.4.6 to Dow Inc.'s Registration Statement on Form S-3 filed with the SEC on April 1, 2019\).](#)
- 10.5.7 [An Amendment to the Dow Inc. 2019 Stock Incentive Plan effective as of April 15, 2021 \(incorporated by reference to Exhibit 10.5.7 to Dow Inc.'s Current Report on Form 8-K filed with the SEC on April 16, 2021\).](#)
- 10.6 [The Dow Chemical Company Executives' Supplemental Retirement Plan - Restricted and Cadre Benefits, as restated and effective September 1, 2017 \(incorporated by reference to Exhibit 10\(a\)\(iv\) to The Dow Chemical Company's Current Report on Form 8-K filed with the SEC on November 3, 2017\).](#)
- 10.6.1 [An Amendment to The Dow Chemical Company Executives' Supplemental Retirement Plan - Restricted and Cadre Benefits, effective January 1, 2018 \(incorporated by reference to Exhibit 10.1.2 to The Dow Chemical Company's Annual Report on Form 10-K for the year ended December 31, 2018\).](#)
- 10.7 [The Dow Chemical Company Executives' Supplemental Retirement Plan - Supplemental Benefits, as restated and effective September 1, 2017 \(incorporated by reference to Exhibit 10\(a\)\(v\) to The Dow Chemical Company's Current Report on Form 8-K filed with the SEC on November 3, 2017\).](#)
- 10.8 [The Dow Chemical Company Elective Deferral Plan \(Pre-2005\), restated and effective as of April 1, 2019 \(incorporated by reference to Exhibit 10.8 to Dow Inc. and The Dow Chemical Company's Quarterly Report on Form 10-Q filed with the SEC on May 3, 2019\).](#)

- 10.9 [The Dow Chemical Company Elective Deferral Plan \(Post 2004\), restated and effective as of April 1, 2019 \(incorporated by reference to Exhibit 4.1 to The Dow Chemical Company's Registration Statement on Form S-8 POS filed with the SEC on April 1, 2019\).](#)
- 10.9.1 [The Dow Chemical Company Elective Deferral Plan \(Post 2004\), restated and effective as of January 1, 2022 \(incorporated by reference to Exhibit 10.9.1 to Dow Inc. and The Dow Chemical Company's Current Report on Form 8-K filed with the SEC on February 3, 2022\).](#)
- 10.10 [Dow Inc. Voluntary Deferred Compensation Plan for Non-Employee Directors, restated and effective as of April 1, 2019 \(incorporated by reference to Exhibit 10.10 to Dow Inc. and The Dow Chemical Company's Quarterly Report on Form 10-Q filed with the SEC on May 3, 2019\).](#)
- 10.11 [Dow Inc. 2021 Employee Stock Purchase Plan effective as of April 15, 2021 \(incorporated by reference to Exhibit 10.11 to Dow Inc.'s Current Report on Form 8-K filed with the SEC on April 16, 2021\).](#)
- 21* [Subsidiaries of Dow Inc.](#)
- 23.1.1* [Consent of Independent Registered Public Accounting Firm for Dow Inc.](#)
- 23.1.2* [Consent of Independent Registered Public Accounting Firm for The Dow Chemical Company.](#)
- 23.2* [Ankura Consulting Group, LLC's Consent.](#)
- 31.1* [Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.](#)
- 31.2* [Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.](#)
- 32.1* [Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.](#)
- 32.2* [Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.](#)
- 101.INS 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. The cover page interactive data file does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.

*Filed herewith

A copy of any exhibit can be obtained via the Internet through the Investor Relations section of the Company's website (www.dow.com/investors), or the Company will provide a copy of any exhibit upon receipt of a written request for the particular exhibit or exhibits desired. All requests should be addressed to the Controller and Vice President of Controllers and Tax of the Company at the address of the Company's principal executive offices. The referenced website and its content are not deemed incorporated by reference into this report.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries
Valuation and Qualifying Accounts

Schedule II

(In millions) For the years ended Dec 31,	2021	2020	2019
Accounts Receivable - Allowance for Doubtful Receivables			
Balance at beginning of year	\$ 51	\$ 45	\$ 42
Additions charged to expenses ¹	16	22	24
Deductions from reserves ²	(13)	(16)	(21)
Balance at end of year	\$ 54	\$ 51	\$ 45
Inventory - Obsolescence Reserve			
Balance at beginning of year	\$ 23	\$ 35	\$ 23
Additions charged to expenses	3	2	19
Deductions from reserves ³	(12)	(14)	(7)
Balance at end of year	\$ 14	\$ 23	\$ 35
Reserves for Other Investments and Noncurrent Receivables			
Balance at beginning of year	\$ 2,093	\$ 2,215	\$ 460
Additions charged to expenses ¹	19	7	1,758
Deductions from reserves ⁴	(79)	(129)	(3)
Balance at end of year	\$ 2,033	\$ 2,093	\$ 2,215
Deferred Tax Assets - Valuation Allowance			
Balance at beginning of year	\$ 1,302	\$ 1,262	\$ 1,225
Additions charged to expenses	201	313	140
Deductions from reserves	(112)	(273)	(103)
Balance at end of year	\$ 1,391	\$ 1,302	\$ 1,262

1. In 2019, additions charged to expenses for "Accounts Receivable - Allowance for Doubtful Receivables" included \$2 million and additions charged to expenses for "Reserves for Other Investments and Noncurrent Receivables" included \$1,753 million related to the Company's investment in Sadara Chemical Company ("Sadara"). See Note 12 to the Consolidated Financial Statements for additional information.

2. Deductions included write-offs, recoveries, currency translation adjustments and other miscellaneous items.

3. Deductions included disposals and currency translation adjustments.

4. Deductions from reserves for "Reserves for Other Investments and Noncurrent Receivables" included \$77 million in 2021 and 2020 related to the Company's investment in Sadara. See Note 12 to the Consolidated Financial Statements for additional information.

Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries
Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized, on February 4, 2022.

DOW INC.
THE DOW CHEMICAL COMPANY

/s/ RONALD C. EDMONDS

Ronald C. Edmonds, Controller and Vice President of
Controllers and Tax
(Authorized Signatory and Principal Accounting Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed below on February 4, 2022 by the following persons on behalf of the registrant and in the capacities indicated.

/s/ SAMUEL R. ALLEN

Samuel R. Allen, Director, Dow Inc.

/s/ GAURDIE BANISTER JR.

Gaurdie Banister Jr., Director, Dow Inc.

/s/ WESLEY G. BUSH

Wesley G. Bush, Director, Dow Inc.

/s/ RICHARD K. DAVIS

Richard K. Davis, Lead Director, Dow Inc.

/s/ DEBRA L. DIAL

Debra L. Dial, Director, Dow Inc.

/s/ RONALD C. EDMONDS

Ronald C. Edmonds, Controller and Vice President of
Controllers and Tax, Dow Inc.
and TDCC (Authorized Signatory and Principal Accounting
Officer)

/s/ JEFF M. FETTIG

Jeff M. Fettig, Director, Dow Inc.

/s/ JIM FITTERLING

Jim Fitterling, Director, Chairman and Chief Executive Officer,
Dow Inc. and TDCC (Principal Executive Officer)

/s/ JACQUELINE C. HINMAN

Jacqueline C. Hinman, Director, Dow Inc.

/s/ LUIS ALBERTO MORENO MEJIA

Luis Alberto Moreno Mejia, Director, Dow Inc.

/s/ HOWARD UNGERLEIDER

Howard Ungerleider, President and Chief Financial Officer, Dow
Inc. and TDCC;
Director, TDCC (Principal Financial Officer)

/s/ JILL S. WYANT

Jill S. Wyant, Director, Dow Inc.

/s/ DANIEL W. YOHANNES

Daniel W. Yohannes, Director, Dow Inc.

Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries
Trademark Listing

The following trademarks or service marks of The Dow Chemical Company and certain affiliated companies of Dow appear in this report: ACOUSTICRYL, ACRY SOL, ACUSOL, AMPLIFY, AQUASET, AVANSE, CARBOWAX, DOW, DOWANOL, DOWSIL, DOWTHERM, ECOFAST, ELITE, EVOQUE, FASTRACK, FORMASHIELD, INFUSE, MAINCOTE, NORDEL, OPULUX, PRIMAL, RENUVA, RHOBARR, RHOPLEX, ROBOND, SENTRY, SILASTIC, SPECFLEX, SUNSPHERES, SURLYN, SYL-OFF, SYNTEGRA, TAMOL, TERGITOL, TRITON, UCAR, UCARE, UCON, VERSENE, WALOCEL

The following registered service mark of American Chemistry Council in the United States appears in this report:
Responsible Care®

The following registered trademark of Disability:IN appears in this report: Disability Equality Index®

The following trademark of Everbridge appears in this report: Critical Event Management (CEM) Certification™ Program

The following trademarks and registered trademarks of Great Place to Work® Institute, Inc. appears in this report: Great Place to Work®, Fortune 100 Best Companies to Work For®, Best Workplaces™, PEOPLE Companies that Care®, Best Workplaces in Manufacturing & Production™

The following registered trademark of InspereX Holdings LLC appears in this report: InterNotes®

® ™ Trademark of The Dow Chemical Company ("TDCC") or an affiliated company, except as otherwise specified.

**Subsidiaries of Dow Inc.
At December 31, 2021**

EXHIBIT 21

	<i>Location*</i>
This list includes companies for which the effective ownership by Dow Inc. is 50 percent or more.	
Dow Inc.	Delaware
The Dow Chemical Company	Delaware
American Mortell Corporation	Texas
Mortell Company	Delaware
Arabian Chemical Company (Latex) Ltd. (1)	Saudi Arabia
Arabian Chemical Company (Polystyrene) Limited (1)	Saudi Arabia
Battleground Water Company	Texas
Chemars III LLC	Delaware
DCOMCO, Inc.	Delaware
Dow Chemical (China) Investment Company Limited	China
Dow Chemical (Guangzhou) Company Limited	China
Dow Chemical (Shanghai) Company Limited	China
Dow Chemical (Sichuan) Co., Ltd.	China
Dow Chemical (Zhangjiagang) Company Limited	China
Dow Chemical Costa Rica S.A.	Costa Rica
Dow Chemical Delaware Corp.	Delaware
Dow Chemical International Ltd.	Delaware
Dow Chemical Costa Rica S.A.	Costa Rica
Dow Chemical Thailand Ltd.	Thailand
MTP HPPO Manufacturing Company Limited	Thailand
Dow International Holdings Company	Delaware
Petroquimica-Dow S.A. (Petrodow)	Chile
Univation Technologies, LLC	Delaware
Univation Technologies (Hong Kong) Limited	Hong Kong
Univation (Zhangjiagang) Chemical Company Limited	China
Univation Technologies International, LLC	Delaware
Dow Chemical Kuwait B.V.	Netherlands
Dow Chemical Singapore Holdings Pte. Ltd.	Singapore
Dow Chemical Telecommunications Corp.	Delaware
Dow Deutschland Inc.	Delaware
Dow Chemical Inter-American Limited	Delaware
Dow Quimica de Colombia S.A.	Colombia
Dow Engineering Company	Delaware
Dow Engineering, Inc.	Michigan
Dow Financial Services Inc.	Delaware
Dow Global Financial Management, Inc.	Delaware
Dow Global Technologies LLC	Delaware
Dow Technology Investments LLC	Delaware
Dow Hydrocarbons and Resources LLC	Delaware
Cayuse Pipeline, Inc.	Texas
Dow Intrastate Gas Company	Louisiana
Dow Pipeline Company	Texas
Fort Saskatchewan Ethylene Storage Corporation (1)	Canada
Fort Saskatchewan Ethylene Storage Limited Partnership	Canada
K/D/S Promix, LLC (1)	Texas
Dow International Holdings Company	Delaware
Dow Global Holdings, Inc.	Delaware
Dow Global Holdings Netherlands B.V.	Netherlands
Dow Luxembourg Spectrum Holding S.a.r.l.	Luxembourg
3308597 Nova Scotia Company	Canada
Dow Switzerland Holding S.A.	Switzerland
DC Fin. (Singapore) Pte. Ltd.	Singapore
Dow (Shanghai) Holding Co., Ltd.	China
Dow Europe Holding B.V.	Netherlands
BASF DOW HPPO B.V. (1)	Netherlands
BASF DOW HPPO Technology B.V. (1)	Netherlands
Dow Austria Gesellschaft m.b.H.	Austria
Dow Belgium B.V.	Belgium
Dow Benelux B.V.	Netherlands
Polyol Belgium B.V.	Belgium
Terneuzen Partnership Services B.V.	Netherlands
Valuepark Terneuzen C.V. (1)	Netherlands
Valuepark Terneuzen Beheer B.V. (1)	Netherlands
Valuepark Terneuzen C.V. (1)	Netherlands
Dow Benelux Integrated Center B.V.	Netherlands
Dow Chemical Company Limited	United Kingdom

**Subsidiaries of Dow Inc.
At December 31, 2021**

EXHIBIT 21

	<i>Location*</i>
This list includes companies for which the effective ownership by Dow Inc. is 50 percent or more.	
Dow Limited	United Kingdom
Dow Services Trustees UK Limited	United Kingdom
Hyperlast Limited	United Kingdom
Dow Chemical East Africa Limited	Kenya
Dow Chemical Iberica S.L.	Spain
Terminal de Atraque de Productos Petroquimicos, A.I.E. (1)	Spain
Transformadora de Etileno A.I.E. (1)	Spain
Dow Chemical Korea Limited	Korea
Dow Chemical OOO	Russia
Dow Chemical Romania S.R.L.	Romania
Dow Chemical West Africa Limited	Ghana
Dow Danmark A/S	Denmark
Dow Europe GmbH	Switzerland
Dow Chemical IMEA GmbH	Switzerland
Dow Egypt Services Limited	Egypt
Dow International Finance S.a.r.l.	Luxembourg
Dow Mideast Systems S.A.E. (JSC)	Egypt
Dow Netherlands Tulip Holding B.V.	Netherlands
Dow Hellas Single-Member AVEE	Greece
Dow Hungary Kft.	Hungary
Dow Industrial Chemical Products Nigeria Limited	Nigeria
Dow InterBranch B.V.	Netherlands
Dow Chemical East Africa Limited	Kenya
Dow Industrial Chemical Products Nigeria Limited	Nigeria
Dow Material Sciences Ltd.	Israel
Dow Materials Science Saudi Arabia Limited	Saudi Arabia
Dow Mideast Systems S.A.E. (JSC)	Egypt
Dow Morocco SARL	Morocco
Dow Norge A/S	Norway
Dow Quimica de Colombia S.A.	Colombia
Dow Silicones Belgium SRL	Belgium
PT Rohm and Haas Indonesia	Indonesia
Rohm and Haas International SNC	France
Rohm and Haas Latinoamerica, S. de R.L. de C.V.	Mexico
Rohm and Haas Mexico, S. de R.L. de C.V.	Mexico
Dow Italia s.r.l.	Italy
Dow Italia Divisione Commerciale s.r.l.	Italy
Rohm and Haas Italia S.r.l.	Italy
Dow Material Sciences Ltd.	Israel
Dow Mideast Systems S.A.E. (JSC)	Egypt
Dow Egypt Services Limited	Egypt
Dow Morocco SARL	Morocco
Dow Olefinverbund GmbH	Germany
Dow Deutschland Anlagengesellschaft mbH	Germany
InduServ ST GmbH & Co. KG	Germany
Dow Deutschland Verwaltungs Vertriebs GmbH	Germany
Dow Produktions und Vertriebs GmbH & Co. OHG	Germany
Dow Stade Produktions GmbH & Co. OHG	Germany
Dow MF Verwaltungs GmbH	Germany
Dow Produktions und Vertriebs GmbH & Co. OHG	Germany
Dow Stade Produktions GmbH & Co. OHG	Germany
Dow Pipeline Gesellschaft mbH & Co. KG	Germany
Dow Pipeline Verwaltungsgesellschaft mbH	Germany
Dow Silicones Deutschland GmbH	Germany
InduServ SB Anlagenverwaltung GmbH	Germany
InduServ SB GmbH & Co. KG	Germany
InduServ ST Anlagenverwaltung GmbH	Germany
Industriernetzgesellschaft Schkopau mbH	Germany
Dow Performance Materials (Australia) Pty Ltd	Australia
Dow Polska Sp.z.o.o.	Poland
Performance Materials Poland Sp. z o.o.	Poland
Dow Portugal - Produtos Quimicos, Sociedade Unipessoal, Lda	Portugal
Dow Saudi Arabia Holding B.V.	Netherlands
Dow Saudi Arabia Investment B.V.	Netherlands
Dow Materials Science Saudi Arabia Limited	Saudi Arabia

**Subsidiaries of Dow Inc.
At December 31, 2021**

EXHIBIT 21

	<i>Location*</i>
This list includes companies for which the effective ownership by Dow Inc. is 50 percent or more.	
Dow Silicones UK Limited	United Kingdom
Dow Southern Africa (Pty) Ltd	South Africa
Dow Starfish Holding B.V.	Netherlands
Dow Suomi OY	Finland
Performance Materials Finland Oy	Finland
Dow Sverige AB	Sweden
Dow Turkiye Kimya Sanayi ve Ticaret Limited Sirketi	Turkey
Rohm and Haas Kimya Sanayi Limited Sirketi	Turkey
DowAksa Advanced Composites Holdings B.V. (1)	Netherlands
EQUATE Marketing Company E.C. (1)	Bahrain
Finndisp Ltd.	Russia
HPPO Holding & Finance C.V. (1)	Netherlands
MTP HPJV C.V.	Netherlands
MTP HPJV Management B.V.	Netherlands
Palmyra do Brasil Indústria e Comércio de Silício Metálico e Recursos Naturais Ltda.	Brazil
Performance Materials Rus LLC	Russia
PM International Holding 1 B.V.	Netherlands
Performance Materials (Thailand) Limited	Thailand
PM International Holding 3 B.V.	Netherlands
Polyol Belgium B.V.	Belgium
Rohm and Haas (UK) Limited	United Kingdom
Rohm and Haas Denmark Holding Company ApS	Denmark
Rohm and Haas Espana Production Holding, S.L.	Spain
Rohm and Haas Espana, S.L.	Spain
Rohm and Haas Europe Services ApS	Denmark
Rohm and Haas Europe Trading ApS	Denmark
Rohm and Haas Kimyasal Urunler Uretim Dagitim ve Ticaret A.S.	Turkey
Rohm and Haas International SNC	France
Dow France S.A.S.	France
Rohm and Haas Nederland B.V.	Netherlands
RUS Polyurethanes Holding B.V.	Netherlands
Dow Izolan OOO	Russia
Dow Izolan Ukraine LLC	Ukraine
Dow Silicones (Shanghai) Co., Ltd.	China
Dow Silicones Holding Japan G.K.	Japan
Dow Toray Co., Ltd.	Japan
Site Services Japan, Co., Ltd.	Japan
Dow Silicones Netherlands Holding B.V.	Netherlands
Dow Chemical Silicones Korea Ltd.	Korea
Dow Silicones Pte. Ltd.	Singapore
Dow Siloxane (Zhangjiagang) Holding Co. Private Ltd.	Singapore
Dow Siloxanes (Zhangjiagang) Co., Ltd.	China
Rohm and Haas Company	Delaware
Dow Chemical Japan Limited	Japan
Japan Acrylic Chemical Co., Ltd.	Japan
Dow Chemical Philippines, Inc.	Philippines
ROH Holdings 1, LLC	Delaware
Rohm and Haas Equity Corporation	Delaware
Dow Global Holdings, Inc.	Delaware
ROH Holdings 2, LLC	Delaware
Rohm and Haas Chemicals LLC	Delaware
Morton International, LLC	Indiana
Rohm and Haas Chemical (Thailand) Limited	Thailand
Rohm and Haas China, Inc.	Delaware
Beijing Eastern Rohm and Haas Company Limited	China
Rohm and Haas International Trading (Shanghai) Co. Ltd.	China
Shanghai Eastern Rohm and Haas Co., Ltd.	China
Rohm and Haas Denmark Finance A/S	Denmark
Dow Chemical International Private Limited	India
PT Rohm and Haas Indonesia	Indonesia
RH DK Vietnam Holdings ApS	Denmark
Rohm and Haas Vietnam Co., Ltd.	Vietnam
Rohm and Haas (Foshan) Specialty Materials Co., Ltd.	China
Rohm and Haas (Shanghai) Management Co., Ltd.	China
Rohm and Haas Chemicals Singapore Pte. Ltd.	Singapore

**Subsidiaries of Dow Inc.
At December 31, 2021**

EXHIBIT 21

	<i>Location*</i>
This list includes companies for which the effective ownership by Dow Inc. is 50 percent or more.	
Rohm and Haas Texas Incorporated	Texas
Battleground Water Company	Texas
Rohm and Haas Equity Corporation	Delaware
Rohm and Haas Quimica Ltda.	Brazil
Dow International Technology Corporation	Delaware
Dow Netherlands Tulip Holding B.V.	Netherlands
Dow Brasil Industria e Comercio de Produtos Quimicos Ltda.	Brazil
Dow Chemical Pacific (Singapore) Private Limited	Singapore
Dow Chemical (Malaysia) Sdn. Bhd.	Malaysia
Dow Chemical (Myanmar) Limited	Myanmar
Dow Chemical Bangladesh Private Limited	Bangladesh
Dow Chemical International Private Limited	India
Materials Science (India) Private Limited	India
Dow Chemical Pacific Limited	Hong Kong
Dow Chemical Vietnam Limited Liability Company	Vietnam
PT Dow Indonesia	Indonesia
Voltas Water Solutions Private Limited (1)	India
Rohm and Haas Canada Investments Limited	Canada
3229809 Nova Scotia Company	Canada
Dow Investment Argentina S.R.L.	Argentina
Dow Corning de Argentina S.R.L.	Argentina
PBBPolisur S.R.L.	Argentina
Dow Corning de Argentina S.R.L.	Argentina
Performance Materials Argentina SAU	Argentina
Dow Quimica de Colombia S.A.	Colombia
PBBPolisur S.R.L.	Argentina
Rohm and Haas Canada LP	Canada
Dow Investment Argentina S.R.L.	Argentina
Rohm and Haas Canada LP	Canada
Dow Chemical Canada ULC	Canada
3308597 Nova Scotia Company	Canada
3294027 Nova Scotia Limited	Canada
Dow Brasil Industria e Comercio de Produtos Quimicos Ltda.	Brazil
Dow Brasil Sudeste Industrial Ltda.	Brazil
Gemini Logistica e Industria Ltda	Brazil
Rohm and Haas Quimica Ltda.	Brazil
Dow Quimica de Colombia S.A.	Colombia
Fort Saskatchewan Ethylene Storage Limited Partnership	Canada
Palmyra do Brasil Indústria e Comércio de Silício Metálico e Recursos Naturais Ltda.	Brazil
Pétromont and Company, Limited Partnership (1)	Canada
Pétromont Inc. (1)	Canada
Siam Polyethylene Company Limited (1)	Thailand
Sentrachem Limited	South Africa
Dow Olefinverbund GmbH	Germany
Dow Peru S.A.	Peru
Dow Quimica de Colombia S.A.	Colombia
Performance Materials Colombia S.A.S.	Colombia
Dow Quimica Mexicana S.A. de C.V.	Mexico
Dow Roofing Systems LLC	Delaware
Dow Silicones Corporation	Michigan
DC Alabama, Inc.	Delaware
DCC Litigation Facility, Inc.	Delaware
Devonshire Underwriters Ltd.	District of Columbia
Dow (Shanghai) Management Co., Ltd.	China
Dow (Zhangjiagang) Holding Co., Ltd.	China
Dow Chemical International Private Limited	India
Dow Global Holdings, Inc.	Delaware
Dow Netherlands Tulip Holding B.V.	Netherlands
Dow Silicones (Zhangjiagang) Co., Ltd.	China
Dow Silicones Deutschland GmbH	Germany
Valley Asset Leasing, LLC	Delaware
Warbler I LLC	Delaware
Dow South Africa Holdings (Pty) Ltd.	South Africa
Sentrachem Limited	South Africa
Cisvaal (Proprietary) Limited	South Africa

**Subsidiaries of Dow Inc.
At December 31, 2021**

EXHIBIT 21

	<i>Location*</i>
This list includes companies for which the effective ownership by Dow Inc. is 50 percent or more.	
DuPont (Taiwan) Electronic Materials Limited	Taiwan
DuPont Performance Materials (Shanghai) Co., Ltd.	China
Performance Materials (Australia) Pty Ltd	Australia
Performance Materials (Thailand) Limited	Thailand
Performance Materials Japan Kabushiki Kaisha	Delaware
Dow-Mitsui Polychemicals Company, Ltd (1)	Japan
PM EMEA Holding 3 B.V.	Netherlands
Essex Chemical Corporation	New Jersey
Flexible Products Company	Georgia
General Latex and Chemical Corporation	Massachusetts
GWN Holding, LLC	Delaware
Dow Saudi Arabia Product Marketing B.V.	Netherlands
Liana Limited	Delaware
Dorinco Reinsurance Company	Michigan
Dorintal Reinsurance Limited	Vermont
NuvoSun, Inc.	California
PM EMEA Holding 1 B.V.	Netherlands
Performance Materials Netherlands B.V.	Netherlands
Dow Chemical Pakistan (Private) Limited	Pakistan
DuPont Performance Materials Deutschland GmbH	Germany
DuPont Performance Materials Proprietary Limited	South Africa
E&C EMEA Holding 1 B.V.	Netherlands
DuPont Performance Materials International Sarl	Switzerland
Performance Materials (Thailand) Limited	Thailand
Performance Materials Belgium BV	Belgium
PM EMEA Cooperatief U.A.	Netherlands
Performance Materials Bulgaria EOOD	Bulgaria
Performance Materials Czech Republic s.r.o.	Czech Republic
Performance Materials France SAS	France
Performance Materials Iberica, S.L.	Spain
Performance Materials Italy srl	Italy
Performance Materials Ukraine LLC	Ukraine
PM EMEA Cooperatief U.A.	Netherlands
DuPont Performance Materials UK Limited	United Kingdom
Performance Materials Belgium BV	Belgium
Performance Materials Ukraine LLC	Ukraine
POLY-CARB, Inc.	Ohio
Rofan Services LLC	Delaware
H Hotel Holding LLC	Delaware
MVCC Limited Partnership	Delaware
MVCC Limited Partnership	Delaware
Rohm and Haas International Holdings Inc.	Delaware
Dow Chemical Singapore Holdings Pte. Ltd.	Singapore
Dow Chemical (Australia) Pty Ltd	Australia
Dow Chemical (Myanmar) Limited	Myanmar
Dow Chemical (NZ) Limited	New Zealand
Dow Chemical Bangladesh Private Limited	Bangladesh
Dow Chemical International Private Limited	India
Dow Chemical Korea Limited	Korea
PT Dow Indonesia	Indonesia
Terneuzen Investments Holding B.V.	Netherlands
Dow Chemical Taiwan Limited	Taiwan
Rohm and Haas Taiwan, Inc.	Taiwan
Rohm and Haas Mexico, S. de R.L. de C.V.	Mexico
Sentrachem US, Inc.	Delaware
Hampshire Chemical Corp.	Delaware
Siam Polystyrene Company Limited (1)	Thailand
Siam Styrene Monomer Company Limited (1)	Thailand
Siam Synthetic Latex Company Limited (1)	Thailand
Terra Two Taiwan Limited	Taiwan
Union Carbide Corporation	New York
Amerchol Corporation	Delaware
Calidria Corporation	Delaware
Carbide Chemical (Thailand) Limited	Thailand
Dow International Holdings Company	Delaware

**Subsidiaries of Dow Inc.
At December 31, 2021**

EXHIBIT 21

	<i>Location*</i>
This list includes companies for which the effective ownership by Dow Inc. is 50 percent or more.	
Global Industrial Corporation	New York
Peñuelas Technology Park LLC	Delaware
Seadrift Pipeline Corporation	Delaware
South Charleston Sewage Treatment Company	West Virginia
UCAR Louisiana Pipeline Company	Delaware
UCAR Pipeline Incorporated	Delaware
Dow Peru S.A.	Peru
UCAR Emulsion Systems FZE	United Arab Emirates
Umetco Minerals Corporation	Delaware
Predate Properties (Pty) Ltd.	South Africa
Union Carbide Asia Pacific, Inc.	Delaware
Union Carbide Customer Services Pte. Ltd.	Singapore
Union Carbide Middle East Limited	Delaware
Union Carbide Philippines (Far East), Inc.	Philippines
Union Carbide South Africa (Proprietary) Limited	South Africa
Westbridge Insurance Ltd.	Vermont

* Location of incorporation or organization. Primary location of organization is reported for partnerships.

1. These companies are 50 percent owned, nonconsolidated affiliates of Dow Inc. and are accounted for using the equity method. Separate financial statements of these companies are not included in this Annual Report on Form 10-K. These companies are not controlled, directly or indirectly, by Dow Inc. Subsidiaries of these companies, if any, are not listed in this Exhibit 21.

We consent to the incorporation by reference of our reports dated February 4, 2022, relating to (i) the consolidated financial statements and financial statement schedule of Dow Inc. and subsidiaries (the "Company"), and (ii) the effectiveness of the Company's internal control over financial reporting, appearing in the Annual Report on Form 10-K, filed jointly by Dow Inc. and The Dow Chemical Company, for the year ended December 31, 2021, in the following Registration Statements of Dow Inc.:

Form S-3:

No. 333-230668
333-232862

Form S-8:

Nos. 333-220352-01
333-230680
333-230681
333-255472
333-255473

/s/ DELOITTE & TOUCHE LLP

Midland, Michigan
February 4, 2022

We consent to the incorporation by reference of our reports dated February 4, 2022, relating to (i) the consolidated financial statements and financial statement schedule of The Dow Chemical Company and subsidiaries ("TDCC") and (ii) the effectiveness of TDCC's internal control over financial reporting, appearing in the Annual Report on Form 10-K, filed jointly by Dow Inc. and The Dow Chemical Company, for the year ended December 31, 2021, in the following Registration Statements of The Dow Chemical Company:

Form S-3:

No. 333-232862-01

Form S-4:

No. 333-88443
333-234108

Form S-8:

Nos. 33-61795
333-40271
333-91027
333-103519
333-220352

/s/ DELOITTE & TOUCHE LLP

Midland, Michigan

February 4, 2022

Ankura Consulting Group, LLC ("Ankura") hereby consents to the use of Ankura's name and the reference to Ankura's reports in this Annual Report on Form 10-K of Dow Inc. and The Dow Chemical Company for the year ended December 31, 2021, and the incorporation by reference thereof in the following Registration Statements of Dow Inc. and The Dow Chemical Company:

DOW INC.

Form S-3:

No. 333-230668
333-232862

Form S-8:

Nos. 333-220352-01
333-230680
333-230681
333-255472
333-255473

THE DOW CHEMICAL COMPANY

Form S-3:

No. 333-232862-01

Form S-4:

No. 333-88443
333-234108

Form S-8:

Nos. 33-61795
333-40271
333-91027
333-103519
333-220352

/s/ AMY BROCKMAN

Amy Brockman
Senior Managing Director
Ankura Consulting Group, LLC
February 4, 2022

Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

I, Jim Fitterling, certify that:

1. I have reviewed this Annual Report on Form 10-K of Dow Inc. and The Dow Chemical Company;
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 registrants as of, and for, the periods presented in this report;
4. The registrants' other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrants 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 registrants, 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 registrants' 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 registrants' internal control over financial reporting that occurred during the registrants' most recent fiscal quarter (the registrants' fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrants' internal control over financial reporting; and
5. The registrants' other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrants' auditors and the audit committee of registrants' board of directors (or persons performing the equivalent function):
 - 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 registrants' 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 registrants' internal control over financial reporting.

/s/ JIM FITTERLING

Jim Fitterling
Chairman and Chief Executive Officer
February 4, 2022

Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

I, Howard Ungerleider, certify that:

1. I have reviewed this Annual Report on Form 10-K of Dow Inc. and The Dow Chemical Company;
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 registrants as of, and for, the periods presented in this report;
4. The registrants' other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrants 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 registrants, 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 registrants' 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 registrants' internal control over financial reporting that occurred during the registrants' most recent fiscal quarter (the registrants' fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrants' internal control over financial reporting; and
5. The registrants' other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrants' auditors and the audit committee of registrants' board of directors (or persons performing the equivalent function):
 - 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 registrants' 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 registrants' internal control over financial reporting.

/s/ HOWARD UNGERLEIDER

Howard Ungerleider
President and Chief Financial Officer
February 4, 2022

Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

I, Jim Fitterling, Chairman and Chief Executive Officer of Dow Inc. and The Dow Chemical Company (the "Companies"), certify that:

1. the Annual Report on Form 10-K of the Companies for the year ended December 31, 2021 as filed with the Securities and Exchange Commission (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 Companies.

/s/ JIM FITTERLING

Jim Fitterling
Chairman and Chief Executive Officer
February 4, 2022

Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

I, Howard Ungerleider, President and Chief Financial Officer of Dow Inc. and The Dow Chemical Company (the "Companies"), certify that:

1. the Annual Report on Form 10-K of the Companies for the year ended December 31, 2021 as filed with the Securities and Exchange Commission (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 Companies.

/s/ HOWARD UNGERLEIDER

Howard Ungerleider
President and Chief Financial Officer
February 4, 2022