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, 2022**

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from ____________________ to ____________________

Commission File Number: **1-1463**

UNION CARBIDE CORPORATION

(Exact name of registrant as specified in its charter)

New York	**13-1421730**
State or other jurisdiction of incorporation or organization	I.R.S. Employer Identification No.

7501 State Highway 185 North, Seadrift, TX 77983
(Address of principal executive offices) (Zip Code)
Registrant's telephone number, including area code: 361-553-2997

Securities registered pursuant to Section 12(b) of the Act: None

Securities registered pursuant to section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

☐ Yes R No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.

☐ Yes R 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.

R 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 and post such files).

R Yes ☐ No

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

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

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

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

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

☐ Yes R No

At February 1, 2023, 935.51 shares of common stock were outstanding, all of which were held by the registrant's parent, The Dow Chemical Company.

The registrant meets the conditions set forth in General Instruction I(1)(a) and (b) of Form 10-K and is therefore filing this Form with the reduced disclosure format.

DOCUMENTS INCORPORATED BY REFERENCE
None

Union Carbide Corporation

ANNUAL REPORT ON FORM 10-K
For the Fiscal Year Ended December 31, 2022

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Union Carbide Corporation and Subsidiaries

Throughout this Annual Report on Form 10-K, except as otherwise indicated by the context, the terms "Corporation" or "UCC" as used herein mean Union Carbide Corporation and its subsidiaries.

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 the Corporation’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 UCC's products; UCC's expenses, future revenues and profitability; the continuing global and regional economic impacts of the coronavirus disease 2019 pandemic and other public health-related risks and events on the Corporation’s business; any sanctions, export restrictions, supply chain disruptions or increased economic uncertainty related to the ongoing conflict between Russia and Ukraine; capital requirements and need for and availability of financing; unexpected barriers in the development of technology, including with respect to UCC’s contemplated capital and operating projects; 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 UCC'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 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, including the ongoing conflict between Russia and Ukraine; weather events and natural disasters; disruptions in the Corporation’s information technology networks and systems; and, since The Dow Chemical Company ("TDCC"), a wholly owned subsidiary of Dow Inc. (together, with TDCC and its consolidated subsidiaries, "Dow"), is the primary customer of UCC: Dow's ability to realize its commitment to carbon neutrality on the contemplated timeframe; the size of the markets for Dow’s products and services and its ability to compete in such markets; Dow's failure to develop and market new products and optimally manage product life cycles; the rate and degree of market acceptance of Dow’s products; and changes in relationships with Dow’s significant customers and suppliers.

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 the Corporation faces. There may be other risks and uncertainties that the Corporation is unable to identify at this time or that it 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 the Corporation’s business. The Corporation assumes 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.

PART I

ITEM 1. BUSINESS

THE CORPORATION

Union Carbide Corporation is a chemicals and polymers company that has been a wholly owned subsidiary of The Dow Chemical Company ("TDCC") since 2001. TDCC has been a wholly owned subsidiary of Dow Inc. since 2019. Except as otherwise indicated by the context, the terms "Corporation" or "UCC" as used herein mean Union Carbide Corporation and its consolidated subsidiaries.

TDCC conducts its worldwide operations through global businesses. UCC's business activities comprise components of TDCC's global businesses rather than stand-alone operations. Because there are no separate reportable business segments for UCC and no detailed business information is provided to a chief operating decision maker regarding the Corporation's stand-alone operations, the Corporation's results are reported as a single operating segment. In addition, in order to simplify the customer interface process, the Corporation sells substantially all of its products to TDCC. Products are sold to TDCC at prices determined in accordance with the terms of an agreement between UCC and TDCC.

Available Information

The Corporation'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 through the Financial Reports-SEC Filings section of the Corporation's website at *www.unioncarbide.com*, 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*. The Corporation's website and its content are not deemed incorporated by reference into this report.

PRODUCTS

The following is a description of the Corporation's principal products:

Ethylene Oxide/Ethylene Glycol (“EO/EG”) - ethylene oxide, a chemical intermediate primarily used in the manufacture of monoethylene glycol (“MEG”), polyethylene glycol, glycol ethers, ethanolamines, surfactants and other performance chemicals and polymers; di- and triethylene glycol, used in a variety of applications, including boat construction, shoe manufacturing, natural gas-drying and other moisture-removing applications, and plasticizers for safety glasses; and tetraethylene glycol, used predominantly in the production of plasticizers for automotive windows. MEG is used extensively in the production of polyester fiber, resin and film, automotive antifreeze and engine coolants, and aircraft anti-icing and deicing fluids.

Hydrocarbons - ethylene and propylene; internal feedstocks that are primarily consumed by downstream product lines to optimize integration benefits and drive low costs.

Industrial Chemicals and Polymers - broad range of products for specialty applications, including animal food supplements, personal care, industrial and household cleaning, coatings for beverage and food cans, industrial coatings and many other industrial uses. Product lines include acrolein and derivatives, ethyleneamines, CARBOWAX™ and SENTRY™ Polyethylene Glycols and Methoxypolyethylene Glycols, TERGITOL™ and TRITON™ Surfactants, UCAR™ Deicing Fluids, UCARTHERM™ Heat Transfer Fluids and UCON™ Fluids.

Polyethylene - includes FLEXOMER™ Polyethylene, very low-density polyethylene resins used as impact modifiers in other polymers and to produce flexible hose and tubing, frozen-food bags and stretch wrap; TUFLIN™ Linear Low Density and UNIVAL™ High Density Polyethylene resins used in high-volume applications such as housewares; milk, water, bleach and detergent bottles; trash bags; packaging; and water and gas pipe.

Solvents and Intermediates - includes oxo aldehydes, acids and alcohols used as chemical intermediates and industrial solvents and in herbicides, plasticizers, paint dryers, jet-turbine lubricants, lube oil additives, and food and feed preservatives; and esters, which serve as solvents in industrial coatings and printing inks and in the manufacturing processes for pharmaceuticals and polymers.

Technology Licensing and Catalysts - includes catalysts for supply and licensing of the METEOR™ Process for EO/EG and the LP OXO℠ process for oxo alcohols; and licensing of the METEOR™ Process for EO/EG and the LP OXO℠ process for oxo alcohols through Dow Technology Investments LLC, a 50:50 joint venture with Dow Global Technologies LLC, a TDCC subsidiary.

Vinyl Acetate Monomer - a building block for the manufacture of a variety of polymers used in water-based emulsion paints, adhesives, paper coatings, textiles, safety glass and acrylic fibers.

Wire and Cable Applications - polyolefin-based compounds for high-performance insulation, semiconductives and jacketing systems for power distribution, telecommunications, and flame-retardant wire and cable insulation. Key product lines include: REDI-LINK™ Polyethylene-Based Wire and Cable Compounds, SI-LINK™ Polyethylene-Based Low Voltage Insulation Compounds, UNIGARD™ HP High-Performance Flame-Retardant Compounds, UNIGARD™ RE Reduced Emissions Flame-Retardant Compounds, and UNIPURGE™ Purging Compounds.

COMPETITION
The chemical industry has been historically competitive and this competitive environment is expected to continue. Large, multinational chemical firms, as well as the chemical divisions of the major national and international oil companies, provide substantial competition both in the United States and abroad.

PATENTS, LICENSES AND TRADEMARKS
The Corporation continually applies for and obtains U.S. and foreign patents that relate to a wide variety of products and processes, has a substantial number of pending patent applications throughout the world and is licensed under a number of patents. At December 31, 2022, the Corporation owned 66 active U.S. patents and 385 active foreign patents related to a wide variety of products and processes. These patents expire as follows:

Remaining Life of Patents Owned at Dec 31, 2022	*United States*	*Rest of World*
Within 5 years	10	58
6 to 10 years	46	290
11 to 15 years	9	32
16 to 20 years	1	5
Total	66	385

The Corporation also has a large number of trademarks. Although the Corporation 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.

PROTECTION OF THE ENVIRONMENT
Matters pertaining to the environment are discussed in Management's Discussion and Analysis of Financial Condition and Results of Operations, and Notes 1 and 13 to the Consolidated Financial Statements.

OTHER ACTIVITIES
Dividends
On a quarterly basis, the Corporation's Board of Directors ("Board") reviews and determines if there will be a dividend distribution to its parent company and sole shareholder, TDCC. The Board takes into consideration the level of earnings and cash flows, among other factors, in determining the amount of the dividend distribution. The Corporation declared and paid cash dividends to TDCC of $1,063 million in 2022 and $288 million in 2021. On January 24, 2023, the Board approved a dividend to TDCC of $135 million, payable on or before March 31, 2023.

ITEM 1A. RISK FACTORS

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

CLIMATE CHANGE - RELATED RISKS

Climate Change: Climate change-related risks and uncertainties, legal or regulatory responses to climate change and a failure of TDCC's parent company, Dow Inc., to meet its climate change commitments could negatively impact the Corporation's results of operations and/or financial condition.

UCC sells substantially all of its products to TDCC in order to simplify the worldwide customer interface process and, as a result, the Corporation is subject to many of the same global risk factors facing TDCC and its parent company, Dow Inc., including those presented by climate change. The Corporation is subject to increasing climate change-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 Corporation as well as those of its customers, end-use customers, partners and vendors.

The transition to lower emissions technology, the effects of carbon pricing and changes in public sentiment, regulations, taxes, 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 Corporation's operations, which would negatively impact the Corporation's results of operations.

In 2020, Dow Inc. announced commitments to reduce its net annual carbon emissions by approximately 15 percent compared with its 2020 baseline by 2030 and its intention to be carbon neutral by 2050. Execution and achievement of these commitments within the currently projected costs and expected timeframes may impact the Corporation's operations and 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 end-use customer preferences and end-use customer acceptance of sustainable supply chain solutions; changes in public sentiment and political leadership; the ability of Dow Inc. and its consolidated subsidiaries 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 Dow Inc. fails to meet its climate change commitments within the committed timeframe and adopt policies and practices to enhance sustainability, Dow Inc.'s reputation and its customer and other stakeholder relationships could be negatively impacted and it may be more difficult for Dow Inc. and its consolidated subsidiaries to compete effectively or gain access to financing on acceptable terms when needed, which would have an adverse effect on the Corporation's results of operations.

PANDEMIC - RELATED RISKS

Public Health Crisis: A public health crisis or global outbreak of disease could have a negative effect on the Corporation's manufacturing operations, supply chain and workforce, creating disruptions that could have a substantial negative impact on the Corporation's results of operations, financial condition and cash flows.

UCC sells substantially all of its products to TDCC in order to simplify the worldwide customer interface process and, as a result, the Corporation is subject to many of the same global risk factors facing TDCC, including those that may be presented by a public health crisis. A public health crisis, including a pandemic similar in nature to COVID-19, could impact all geographic regions where UCC's products are produced and sold. The global, regional and local spread of a public health crisis could result in, and in the past 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. Business disruptions and market volatility resulting from a public health crisis could have a substantial negative impact on the Corporation's results of operations, financial condition and cash flows. The adverse impact of a pandemic could include, and in the past has included, without limitation, a decrease in demand for certain of the Corporation's products; price declines; reduced profitability; supply chain disruptions impeding the Corporation'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; increased cyber security risk and data accessibility disruptions due to remote working arrangements; and workforce reductions. Additional risks may include, but are not limited to: shortages of key raw materials; additional asset impairment charges; increased obligations related to the Corporation’s pension and other postretirement benefit plans; and tax valuation allowances and may also have the effect of heightening many of the other risks described in this "Risk Factors" section.

MACROECONOMIC RISKS

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

The Corporation sells substantially all of its products to TDCC, a wholly owned subsidiary of Dow Inc., which operates in a competitive, global environment, and competes worldwide for sales. Increased levels of competition could result in lower prices or lower sales volume, which could have a negative impact on the Corporation's results of operations. Sales of TDCC'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 Corporation's results of operations.

Economic conditions around the world, and in certain industries in which the Corporation and TDCC do business, also impact sales price and volume. As a result, market uncertainty or an economic downturn driven by inflationary pressures; political tensions; war, including the ongoing conflict between Russia and Ukraine and the related sanctions and export restrictions; terrorism; epidemics; pandemics; or political instability in the geographic regions or industries in which UCC products are sold could reduce demand for these products and result in decreased sales volume, which could have a negative impact on UCC's results of operations.

In February 2022, Russia invaded Ukraine resulting in the United States, Canada, the European Union and other countries imposing economic sanctions on Russia. Dow suspended all purchases of feedstocks and energy from Russia and has significantly reduced its operations and product offerings in the country. Dow has also stopped all investments in and is only supplying limited essential goods to Russia. These actions have not had and are not expected to have a material impact on the Corporation’s financial condition or results of operations. However, the fluidity and continuation of the conflict may result in additional economic sanctions and other impacts which could have a negative impact on TDCC’s financial condition, results of operations and cash flows, which could also negatively impact the Corporation. These include decreased sales; supply chain and logistics disruptions; volatility in foreign exchange rates and interest rates; inflationary pressures on and availability of raw materials and energy, most notably in Europe; and heightened cybersecurity threats.

Financial Flexibility: Market conditions could reduce TDCC's financial flexibility, which could impact the financial flexibility of the Corporation.

Adverse economic conditions could reduce TDCC'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 TDCC and could result in higher borrowing costs. Since TDCC is a service provider, material debtor, and the major customer of the Corporation, reduced financial flexibility for TDCC could potentially impact the financial flexibility of the Corporation.

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

The Corporation has defined benefit pension plans and an other postretirement benefit plan (the "plans") in the United States. The assets of the Corporation'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 and health care cost trends may affect the funded status of the Corporation'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 Corporation's obligations or future funding requirements could have a negative impact on the Corporation's results of operations and cash flows for a particular period and on the Corporation's financial position.

Supply/Demand Balance: Earnings generated by the Corporation 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 Corporation's results of operations.

LEGAL AND REGULATORY RISKS

Environmental Compliance: The costs of complying with evolving regulatory requirements could negatively impact the Corporation'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 Corporation 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. At December 31, 2022, the Corporation had accrued obligations of $183 million ($148 million at December 31, 2021) for probable environmental remediation and restoration costs, including $36 million ($23 million at December 31, 2021) 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 Corporation 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. 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 Corporation'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.

Litigation: The Corporation is party to a number of claims and lawsuits arising out of the normal course of business with respect to commercial matters, including product liability, governmental tax and regulation disputes, and other actions.
The Corporation is involved in a number of legal proceedings and claims with both private and governmental parties. These cover a wide range of matters, including, but not limited to: product liability; trade regulation; governmental tax and regulatory proceedings; health, safety and environmental matters; employment matters; patent infringement; contracts; and commercial litigation. With the exception of the possible effect of the asbestos-related liability described below, it is the opinion of the Corporation's management that the possibility is remote that the aggregate of all such claims and lawsuits will have a material adverse impact on the Corporation's consolidated financial statements.

The Corporation 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, 2022, the Corporation's total asbestos-related liability for pending and future claims, including future defense and processing costs, was $947 million ($1,016 million at December 31, 2021). See Notes 1 and 13 to the Consolidated Financial Statements for more information on asbestos-related matters.

Health and Safety: Increased concerns regarding the safe use of chemicals and plastics in commerce and their potential impact on the environment have 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 and continued pressure for more stringent regulatory intervention and litigation. These concerns could also influence public perceptions, the viability or continued sales of the Corporation's products, the Corporation's 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 Corporation'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.

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 Corporation’s plastic products and could negatively impact the Corporation’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. Substantially all of the Corporation's sales are to TDCC, which is one of the world’s largest producers of plastics. Therefore, 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 Corporation’s polyethylene products which could negatively impact the Corporation's financial condition, results of operations and cash flows.

OPERATIONAL RISKS
Raw Materials: Availability of purchased feedstocks and energy, and the volatility of these costs, impact the Corporation's operating costs and add variability to earnings.
Purchased feedstock and energy costs account for a substantial portion of the Corporation's total production costs and operating expenses. The Corporation purchases hydrocarbon raw materials including ethane, propane, butane and naphtha as feedstocks. The Corporation also purchases certain monomers, primarily ethylene and propylene, to supplement internal production, as well as other raw materials. The Corporation 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. 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 Corporation's results of operations.

While the Corporation expects abundant and cost-advantaged supplies of natural gas liquids ("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 Corporation's results of operations and future investments. Also, if the Corporation's key suppliers of feedstocks and energy are unable to provide the raw materials required for production, it could have a negative impact on the Corporation's results of operations.

Operational Event: A significant operational event could negatively impact the Corporation's results of operations.
As a diversified chemical manufacturing company, the Corporation's operations, the transportation of products, cyber-attacks, pandemics 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 Corporation's results of operations.

Major hurricanes and other weather-related events have caused significant disruption in UCC'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 UCC's products. Due to the Corporation's substantial presence on the U.S. Gulf Coast, similar severe weather conditions or other natural phenomena in the future could negatively impact UCC's results of operations.

Cyber Threat: The risk of loss of the Corporation's trade secrets, know-how or other sensitive business information or disruption of operations could negatively impact the Corporation's financial results.
Cyber-attacks or security breaches could compromise confidential, business critical information, cause a disruption in the Corporation's operations or harm the Corporation's reputation. The Corporation has attractive information assets, including trade secrets, know-how and other sensitive, business critical information. While the Corporation 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 Corporation's financial results.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

The Corporation operates eight manufacturing sites in three countries. The Corporation considers its properties to be in good operating condition and that its machinery and equipment have been well maintained. The following are the major production sites:

United States: Hahnville (St. Charles), Louisiana; Seadrift and Texas City, Texas.

All of UCC's plants are owned or leased, subject to certain easements of other persons that, 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.

A summary of property, classified by type, is contained in Note 9 to the Consolidated Financial Statements.

ITEM 3. LEGAL PROCEEDINGS

Asbestos-Related Matters
The Corporation 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 UCC sold in the past, alleged exposure to asbestos-containing products located on UCC's premises, and UCC's responsibility for asbestos suits filed against a former subsidiary, Amchem Products, Inc.

For additional information, see Asbestos-Related Matters in Management's Discussion and Analysis of Financial Condition and Results of Operations, and Notes 1 and 13 to the Consolidated Financial Statements.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

The Corporation is a wholly owned subsidiary of TDCC; therefore, there is no public trading market for the Corporation's common stock.

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

Pursuant to General Instruction I of Form 10-K "Omission of Information by Certain Wholly-Owned Subsidiaries," this section includes only management's narrative analysis of the results of operations for the year ended December 31, 2022, the most recent fiscal year, compared with the year ended December 31, 2021, the fiscal year immediately preceding it.

References to "TDCC" refer to The Dow Chemical Company and its consolidated subsidiaries, except as otherwise indicated by the context. Union Carbide Corporation (the "Corporation" or "UCC") has been a wholly owned subsidiary of TDCC since 2001. TDCC has been a wholly owned subsidiary of Dow Inc. since 2019. References to "Dow" refer to Dow Inc., together with TDCC and its consolidated subsidiaries.

TDCC conducts its worldwide operations through global businesses. UCC's business activities comprise components of TDCC's global businesses rather than stand-alone operations. Because there are no separate reportable business segments for UCC and no detailed business information is provided to a chief operating decision maker regarding the Corporation's stand-alone operations, the Corporation's results are reported as a single operating segment.

RESULTS OF OPERATIONS

Net Sales

Total net sales for 2022 were $5,449 million, compared with net sales of $5,105 million in 2021, an increase of 7 percent. Net sales to related companies, principally to TDCC, were $5,258 million for 2022, compared with $4,951 million for 2021, an increase of 6 percent. Selling prices to TDCC are determined in accordance with the terms of an agreement between UCC and TDCC.

Average selling price increased 9 percent in 2022 compared with 2021. Price increased across almost all product lines, driven by tight industry supply and demand dynamics and rising raw material and feedstock costs, with the most significant price increases in ethanolamines, glycol ethers, plastics used for wire and cable applications and ethyleneamines, partially offset by lower polyethylene prices. Volume decreased 2 percent in 2022 compared with 2021, as lower volume in vinyl acetate monomers, due to reduced demand, raw material supply constraints and unplanned maintenance, downtime and process issues due to a utility outage in the first quarter of 2022, and a volume decrease in polyethylene, more than offset volume growth in polyglycols, acrylic monomers, ethanolamines and plastics used for wire and cable applications.

Cost of Sales

Cost of sales in 2022 was $4,586 million, up 3 percent from $4,463 million in 2021. The increase in cost of sales was driven by higher raw material and feedstock costs. Cost of sales in 2022 was also negatively impacted by environmental charges of $37 million in the first quarter of 2022, resulting from updated remediation estimates and scope changes on existing matters. Cost of sales in 2022 was positively impacted by third party insurance recoveries related to covered losses resulting from severe weather events on the U.S. Gulf Coast in 2021, which were facilitated by TDCC through its global insurance program. Cost of sales in 2021 was positively impacted by insurance recoveries from TDCC's insurance affiliate related to covered losses resulting from severe weather events on the U.S. Gulf Coast in 2021.

Interest Income

Interest income for 2022 was $18 million, compared with $2 million in 2021. The increase in interest income primarily resulted from the significant increase in interest rates in 2022. See Note 18 to the Consolidated Financial Statements for additional information related to the Corporation's cash management activities.

Provision for Income Taxes
The Corporation reported a tax provision of $172 million in 2022, which resulted in an overall effective tax rate of 22.5 percent. In 2021, the Corporation reported a tax provision of $154 million, which resulted in an overall effective tax rate of 29.1 percent. In 2021, the Corporation recognized additional charges related to state and local jurisdictions and an uncertain tax position related to litigation in a foreign jurisdiction which negatively impacted the effective tax rate. The underlying factors affecting UCC's overall effective tax rates are summarized in Note 7 to the Consolidated Financial Statements.

Net Income Attributable to UCC
The Corporation reported net income of $594 million in 2022, compared with net income of $375 million in 2021. Net income for 2021 was negatively impacted by production disruptions, increasing feedstock and energy costs not recovered through selling price increases, and repair and start-up costs due to extreme weather and extended outages caused by Winter Storm Uri in the first quarter of 2021 and Hurricane Ida in the third quarter of 2021.

Capital Expenditures
Capital spending in 2022 was $143 million, compared with $121 million in 2021. Capital spending increased primarily due to ongoing projects to install additional air pollution control and monitoring technology on steam-assisted flares at the Corporation's olefins manufacturing facility in St. Charles, Louisiana.

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 accounting principles generally accepted in the United States of America ("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 preparation of the Consolidated Financial Statements. Following are the Corporation's accounting policies impacted by judgments, assumptions and estimates.

Asbestos-Related Matters
The Corporation 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 UCC sold in the past, alleged exposure to asbestos-containing products located on UCC’s premises, and UCC’s responsibility for asbestos suits filed against a former UCC subsidiary, Amchem Products, Inc. ("Amchem"). Each year, Ankura Consulting Group, LLC ("Ankura") performs a review for UCC based upon historical asbestos claims and resolution activity and historical defense spending. UCC compares current asbestos claim, resolution and defense spending activity to the results of the most recent Ankura study at each balance sheet date to determine whether the asbestos-related liability for pending and future claims, including future defense and processing costs, continues to be appropriate.

For additional information, see Part I, Item 3. Legal Proceedings; Asbestos-Related Matters in Management's Discussion and Analysis of Financial Condition and Results of Operations; and Notes 1 and 13 to the Consolidated Financial Statements.

Environmental Matters
The Corporation 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, 2022, the Corporation had accrued obligations of $183 million for probable environmental remediation and restoration costs, including $36 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 Corporation 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 Notes 1 and 13 to the Consolidated Financial Statements.

Pension Plans 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, 2022, 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 16 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 Corporation 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. Under the spot rate approach, the Corporation calculates service cost and interest cost by applying individual spot rates from 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 the separate expected cash flow components of service cost and interest cost.

The Corporation 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 Corporation's historical experience with the pension fund asset performance is also considered. 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 2022 and 2021 was 6.80 percent. This assumption will also be used for determining 2023 net periodic pension expense. 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 Corporation's pension plans.

The discount rates utilized to measure the pension and other postretirement benefit obligations are based on the yield on high-quality corporate fixed income investments at the measurement date. Future expected actuarially determined cash flows for the 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 was 5.60 percent at December 31, 2022 and 2.94 percent at December 31, 2021.

The value of the qualified plan assets totaled $2.7 billion at December 31, 2022, a decrease from $3.6 billion at December 31, 2021. The underfunded status of the qualified plan decreased by $140 million at December 31, 2022, compared with December 31, 2021. The Corporation did not make contributions to the qualified plan in 2022.

The assumption for the long-term rate of increase in compensation levels was 4.25 percent at December 31, 2022 and 2021. Since 2002, the Corporation has used a generational mortality table to determine the duration of its pension and other postretirement obligations.

The Corporation 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 of plan assets will be impacted when previously deferred gains or losses are recorded. Over the life of the plan, both gains and losses have been recognized and amortized. At December 31, 2022, $507 million of net losses remain to be recognized in the calculation of the market-related value of plan assets. These net losses will result in increases in future pension expense as they are recognized in the market-related value of assets.

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

Net Decrease in Market-Related Asset Value Due to Recognition of Prior Losses In millions	
2023	$ 74
2024	124
2025	153
2026	156
Total	$ 507

The Corporation expects pension expense to increase in 2023 by approximately $30 million, driven primarily by discount rate increases, resulting in higher interest cost, partially offset by a reduction in the amortization of actuarial losses.

A 25 basis point adjustment in the long-term return on assets assumption would change the Corporation's total pension expense by $8 million for 2023. A 25 basis point adjustment in the discount rate assumption would change the Corporation's total pension expense by $1 million for 2023.

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 Corporation recognizes future tax benefits, such as net operating loss carryforwards and tax credit carryforwards, to the extent that realizing these benefits is considered more likely than not.

At December 31, 2022, the Corporation had a net deferred tax asset balance of $239 million, after valuation allowances of $15 million. In evaluating the ability to realize the deferred tax assets, the Corporation 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.

The Corporation recognizes the financial statement effects of an uncertain tax position when it is more likely than not, based on technical merits, that the position will be sustained upon examination. At December 31, 2022, the Corporation had a liability for uncertain tax positions of $8 million. For additional information, see Note 7 to the Consolidated Financial Statements.

Environmental Matters

Environmental Policies

The Corporation is committed to world-class environmental, health and safety ("EH&S") performance, as demonstrated by a long-standing commitment to Responsible Care®, as well as a strong commitment to Dow's 2025 Sustainability Goals and Dow's drive to deliver against new targets on climate protection and a circular economy. These goals and targets set the standard for sustainability in the chemical industry by focusing on improvements in UCC's local corporate citizenship and product stewardship, and by actively pursuing methods to reduce the Corporation's environmental impact.

To help meet Dow'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, UCC has well-defined policies, requirements and management systems. Dow's EH&S management system ("EMS") defines the "who, what, when and how" needed for the Corporation to implement the policies and requirements and meet performance objectives, leadership expectations and public commitments. To ensure effective utilization, Dow's EMS is integrated into a company-wide management system for EH&S, Operations, Quality and Human Resources.

Dow 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, including UCC sites, have received third-party verification of compliance with Responsible Care® and with outside specifications such as ISO-14001. Dow 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.

Chemical Security

Public and political attention continues to be placed on the protection of U.S. critical infrastructure, including the chemical industry, from security threats. Sabotage, terrorism, war, natural disasters and cyber incidents have increased global concerns about the security and safety of chemical production and distribution. UCC continues to improve its security plans, placing emphasis on the safety of UCC communities and people by being prepared to meet risks at any level and to address both internal and external identifiable risks. UCC's security plans are designed to avert interruptions of normal business operations that could have a material impact on the Corporation's results of operations, financial condition and cash flows.

UCC is a Responsible Care® company and adheres to the Responsible Care® Security Code, which requires that all aspects of security - including facility, transportation and cyberspace - be assessed and gaps addressed. Through global implementation of the Security Code, including voluntary security enhancements and upgrades, UCC has permanently heightened its level of security - not just in the United States, but worldwide. Further, the Corporation’s Distribution Risk Review process addresses potential threats in all modes of transportation across the supply chain. In 2019, Dow Inc. established its Global Security Operations Center ("GSOC") to provide 24-hour/day, 365-day/year real-time monitoring of global risks to Dow Inc. assets and people, which includes UCC 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 Inc. and UCC crises.

To reduce vulnerabilities, UCC maintains security measures that meet or exceed regulatory and industry security standards in all areas in which UCC operates. Assessment and improvement costs are not considered material to the Corporation's consolidated financial statements.

Climate Protection

Addressing climate-related risks and opportunities is part of Dow’s overall climate strategy, which encompasses UCC's operations. This science-based strategy includes a phased approach to decarbonize while meeting growing demand for Dow's products and contributing to a low-carbon future through continued investment in new products, technologies and processes. In 2020, Dow announced commitments to reduce its net annual Scope 1 and 2 carbon emissions by an additional 5 million metric tons by 2030 versus its 2020 baseline, a 15 percent reduction and a 30 percent reduction since 2005 as Dow had reduced its carbon emissions 15 percent between 2005 and 2020. Additionally, Dow announced its intention to be carbon neutral by 2050 (Scope 1+2+3, as defined by the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard, plus product benefits). Reflecting Dow's focus to make meaningful progress in the near term, Dow intends to reduce its carbon emissions by approximately 2 million metric tons from 2022 to 2025 while growing underlying earnings. Dow is also committed to advancing water stewardship within its operations and to working collaboratively to enhance water management at the watershed level. As part of this commitment, Dow has set a global target to reduce freshwater intake intensity by 20 percent at its key water-stressed sites by 2025.

Despite these commitments, climate change-related risks and uncertainties, legal or regulatory responses to climate change, and failure to meet climate change commitments could negatively impact UCC’s operations, financial condition and/or reputation. Climate-related risks include both physical and transition risks.

Physical Risks

Climate-related physical risks include more frequent severe weather events, potential changes in precipitation patterns, water scarcity and extreme variability in weather patterns, which can disrupt the operations of Dow and the Corporation, as well as those of its customers, partners and vendors.

Transition Risks

Climate-related transition risks include the availability, development and affordability of lower greenhouse gas emissions technology, the effects of carbon pricing and changes in public sentiment, regulations, taxes, public mandates or requirements.

The potential impacts of climate-related risks as well as climate-related opportunities are part of Dow's climate strategy and factored into Dow's business and financial planning, which includes UCC's operations. When assessing the magnitude of impact, Dow evaluates elements such as changes to the cost of raw materials, impact on operating cost (e.g., energy costs, costs of complying with regulation), cost of investment in new technology to reduce emissions, impact to the price at which products can be sold, impact of potential lost sales or, in the case of opportunities, improvements in production, increased revenues, cost efficiencies and market share gained. In addition, there could be impacts that need to be considered that cannot be financially quantified (e.g., reputational impact of certain risks and opportunities).

Advancing a Circular Economy

Dow's vision for turning the tide on plastic waste is centered on solving challenges: from designing for recyclability at the beginning of a product's life to increasing Dow's capacity to use plastic waste as feedstock and other alternative feedstock, enabling plastic waste to be blended with virgin plastic as recycled resins, and building and partnering in industrial ecosystems to close the loop. The issue is complex, and through partnerships, Dow is working across the value chain to improve access to collection, recycling, and processing infrastructure and to create new circular business models. As a significant component of Dow's plastics business, UCC is a key participant in Dow's efforts in advancing a circular economy.

Improving circularity of plastics through recycling and reuse is critical to a world that is also targeting carbon emissions reduction. The lower-carbon benefits of polyethylene-based packaging serve as a key driver and source of value, as well as the lifecycle perspective of plastic versus other available materials. Moving to circular products includes increasing the share of plastics production from circular feedstocks. In 2020, Dow announced "stop the waste" and "close the loop" targets to address plastic waste and, in 2022, Dow committed to accelerating the circular ecosystem by turning waste and alternative feedstock into raw materials that help deliver 3 million metric tons per year of circular and renewable solutions by 2030 with a new "transform the waste" sustainability target.

Meeting this expanded "transform the waste" target will require investments in technologies and infrastructure and strategic partnerships. To do this, Dow will expand its efforts to "stop the waste" by building industrial ecosystems to collect, reuse or recycle waste and expand its portfolio to meet rapidly growing demand. Dow expects the waste required to produce this expanded target to surpass and replace its original 1 million metric ton stop the waste goal.

Dow is also working directly with its customers, brand owners and the value chain to help customers redesign and create packaging solutions that are both high-performance and recyclable or made with circular polymers. Dow continuously invests in application development, packaging redesign and infrastructure improvements to deliver on its circularity goals.

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 continuing to invest in an industrial ecosystem for the circular economy. UCC will continue to work with Dow and its subsidiaries to help provide solutions for this global issue.

Environmental Remediation

UCC accrues the costs of remediation of its facilities and formerly owned facilities based on current law and existing technologies. The nature of such remediation includes, for example, the management of soil and groundwater contamination. The 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 consolidated 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 emerging remediation technologies. These liabilities are adjusted periodically as remediation efforts progress or as additional technical or legal information becomes available. The Corporation had an accrued liability of $147 million at December 31, 2022 and $125 million at December 31, 2021, related to the remediation of current or former UCC-owned sites.

In addition to current and former UCC-owned sites, under the Federal Comprehensive Environmental Response, Compensation and Liability Act and equivalent state laws (hereafter referred to collectively as "Superfund Law"), UCC is liable for remediation of other hazardous waste sites where UCC 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, UCC has evaluated its potential liability in light of the number of other companies that also have 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. Management's estimate of the Corporation's remaining liability for the remediation of Superfund sites was $36 million at December 31, 2022 and $23 million at December 31, 2021, which has been accrued, although the ultimate cost with respect to these sites could exceed that amount. The Corporation has not recorded any third-party recovery related to these sites as a receivable.

Information regarding environmental sites is provided below:

Environmental Sites	*UCC-owned Sites* [1]		*Superfund Sites* [2]	
	2022	*2021*	*2022*	*2021*
Number of sites at Jan 1	26	25	66	66
Sites added during year	—	1	—	1
Sites closed during year	—	—	(5)	(1)
Number of sites at Dec 31	26	26	61	66

1. UCC-owned sites are sites currently or formerly owned by UCC. In the United States, remediation obligations are imposed by the Resource Conservation and Recovery Act or analogous state law.
2. Superfund sites are sites, including sites not owned by UCC, where remediation obligations are imposed by Superfund Law.

In total, the Corporation's accrued liability for probable environmental remediation and restoration costs was $183 million at December 31, 2022, compared with $148 million at December 31, 2021. This is management's best estimate of the costs for remediation and restoration with respect to environmental matters for which the Corporation 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 Corporation's results of operations, financial condition and cash flows. It is the opinion of the Corporation's management, however, that the possibility is remote that costs in excess of the range disclosed will have a material impact on the Corporation's results of operations, financial condition and cash flows.

The amounts charged to income on a pretax basis related to environmental remediation totaled $72 million in 2022, $47 million in 2021 and $49 million in 2020. The amounts charged to income on a pretax basis related to operating the Corporation's pollution abatement facilities, excluding internal recharges, totaled $119 million in 2022, $101 million in 2021 and $98 million in 2020. Capital expenditures for environmental protection were $38 million in 2022, $8 million in 2021 and $5 million in 2020. The Corporation is in the process of installing additional air pollution control and monitoring technology on its steam-assisted flares at its olefins manufacturing facility in St. Charles, Louisiana. These installations are expected to result in additional capital expenditures of approximately $60 million over the next three years.

Asbestos-Related Matters
The Corporation 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 UCC sold in the past, alleged exposure to asbestos-containing products located on UCC's premises, and UCC's responsibility for asbestos suits filed against a former UCC 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 UCC's products.

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

Asbestos-Related Claim Activity	*2022*	*2021*	*2020*
Claims unresolved at Jan 1	8,747	9,126	11,117
Claims filed	4,664	4,233	4,857
Claims settled, dismissed or otherwise resolved	(6,538)	(4,612)	(6,848)
Claims unresolved at Dec 31	6,873	8,747	9,126
Claimants with claims against both UCC and Amchem	(1,530)	(2,139)	(2,904)
Individual claimants at Dec 31	5,343	6,608	6,222

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 UCC, 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 personal injury cases in which only the Corporation and/or Amchem are the sole named defendants. For these reasons and based upon the Corporation's litigation and settlement experience, the Corporation does not consider the damages alleged against it 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 in Notes 1 and 13 to the Consolidated Financial Statements.

Debt Covenants and Default Provisions
The Corporation's outstanding public debt has been issued under indentures which contain, among other provisions, covenants that the Corporation must comply with while the underlying notes are outstanding. Such covenants are typically based on the Corporation's size and financial position and include, subject to the exceptions and qualifications contained in the indentures, obligations not to (i) allow liens on principal U.S. manufacturing facilities, (ii) enter into sale and lease-back transactions with respect to principal U.S. manufacturing facilities, or (iii) merge into or consolidate with any other entity or sell or convey all or substantially all of its assets. Failure of the Corporation to comply with any of these covenants could, after the passage of any applicable grace period, result in a default under the applicable indenture which would allow the note holders to accelerate the due date of the outstanding principal and accrued interest on the subject notes. Management believes the Corporation was in compliance with the covenants referred to above at December 31, 2022.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

UCC'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 Corporation 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.

The global nature of UCC's business requires active participation in the foreign exchange markets. As a result of investments, production facilities and other operations on a global basis, the Corporation has assets, liabilities and cash flows in currencies other than the U.S. dollar. The primary objective of the Corporation's foreign exchange risk management is to optimize the U.S. dollar value of net assets and cash flows. To achieve this objective, the Corporation 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 cash flows denominated in foreign currencies. The largest exposures are denominated in the Canadian dollar as well as the currencies of Europe and Asia Pacific.

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

UCC 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 Corporation is a variance/covariance model. This model uses a 97.5 percent confidence level and includes at least one year of historical data. The 2022 and 2021 year-end and average daily VAR for the aggregate of all positions are shown below:

Total Daily VAR at Dec 31	*2022*		*2021*	
In millions	*Year-end*	*Average*	*Year-end*	*Average*
Interest rate	$ 5	$ 4	$ 3	$ 3

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholder and the Board of Directors of Union Carbide Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Union Carbide Corporation and subsidiaries (the "Corporation") as of December 31, 2022 and 2021, the related consolidated statements of income, comprehensive income, equity, and cash flows, for each of the three years in the period ended December 31, 2022, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Corporation as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These financial statements are the responsibility of the Corporation's management. Our responsibility is to express an opinion on the Corporation's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Corporation 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. The Corporation is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Corporation’s internal control over financial reporting. Accordingly, we express no such opinion.

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.

Asbestos- Refer to Notes 1 and 13 to the Financial Statements

Critical Audit Matter Description

The Corporation is and has been involved in a large number of asbestos-related suits filed primarily in state courts during the past four decades. The Corporation expects more asbestos-related suits to be filed against the Corporation and its former subsidiary Amchem Products, Inc. in the future, and will aggressively defend or reasonably resolve, as appropriate, both pending and future claims. Since 2003, the Corporation has engaged a third-party actuarial specialist to review the Corporation's historical asbestos-related claim and resolution activity in order to assist management in estimating the Corporation's asbestos-related liability. The Corporation considers quantitative and qualitative factors such as the nature of pending claims, trial experience of the Corporation and other asbestos defendants, current spending for defense and processing costs, significant appellate rulings and legislative developments, trends in the tort system, and their respective effects on expected future resolution costs.

The Corporation considers the following summarized assumptions and judgments in arriving at the estimated liability:

- The average resolution value calculated by the Corporation to settle each pending and future claim
- The Corporation's estimation of the number of pending and future claims
- The curve of how claims will occur over the estimated period through the terminal year
- The estimated terminal year 2049 (date at which future claims will cease)
- The acceptance rate applied to estimated future claims (the rate at which claims will be resolved with payment)

Given the significant judgments made by management to estimate the asbestos liability, performing audit procedures to evaluate the reasonableness of management's estimates and assumptions related to average resolution value of pending and future claims, estimated number of pending and future claims, curve of how claims will occur, estimated terminal date, and acceptance rate applied to estimated future claims required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to management's estimate and assumptions of the asbestos liability included the following, among other procedures:

- We tested the effectiveness of controls related to the asbestos liability including management's controls over the determination of average resolution value of pending and future claims, estimated number of pending and future claims, valuation of future claims, curve of how claims will occur, the estimated terminal date and the acceptance rate applied to estimated future claims.
- We evaluated the methods and assumptions used by management to estimate the asbestos liability by:
    - Testing the underlying data that served as the basis for the actuarial analysis, including historical claims, to test that the inputs to the actuarial estimate were reasonable.
    - Comparing management's prior-year assumptions of expected development and ultimate loss to actuals incurred during the current year to identify potential bias in the determination of the asbestos-related liabilities.
- With the assistance of our actuarial specialists, we independently developed scenario-adjusted estimates of the asbestos-related liabilities, including loss data and industry claim development factors, and compared our estimates to management's estimates.
- We read external information included in regulatory filings and news releases to search for contradictory evidence.

/s/ DELOITTE & TOUCHE LLP
Midland, Michigan
February 1, 2023

We have served as the Corporation's auditor since 2001.

Union Carbide Corporation and Subsidiaries

Consolidated Statements of Income

(In millions) For the years ended Dec 31,	2022	2021	2020
Net trade sales	$ 191	$ 154	$ 129
Net sales to related companies	5,258	4,951	3,574
Total net sales	5,449	5,105	3,703
Cost of sales	4,586	4,463	3,245
Research and development expenses	26	25	24
Selling, general and administrative expenses	10	9	9
Restructuring and asset related charges - net	—	1	15
Sundry income (expense) - net	(53)	(53)	168
Interest income	18	2	12
Interest expense and amortization of debt discount	26	27	33
Income before income taxes	766	529	557
Provision for income taxes	172	154	130
Net income attributable to Union Carbide Corporation	$ 594	$ 375	$ 427

See Notes to the Consolidated Financial Statements.

Union Carbide Corporation and Subsidiaries

Consolidated Statements of Comprehensive Income

(In millions) For the years ended Dec 31,	2022	2021	2020
Net income attributable to Union Carbide Corporation	$ 594	$ 375	$ 427
Other comprehensive income (loss), net of tax			
Cumulative translation adjustments	(1)	2	1
Pension and other postretirement benefit plans	150	217	(106)
Total other comprehensive income (loss)	149	219	(105)
Comprehensive income attributable to Union Carbide Corporation	$ 743	$ 594	$ 322

See Notes to the Consolidated Financial Statements.

Union Carbide Corporation and Subsidiaries
Consolidated Balance Sheets

(In millions, except share amounts) At Dec 31,	2022	2021
Assets		
Current Assets		
Cash and cash equivalents	$ 10	$ 11
Accounts receivable:		
Trade (net of allowance for doubtful receivables 2022: $—; 2021: $—)	40	49
Related companies	766	1,394
Other	24	29
Income taxes receivable	211	306
Notes receivable from related companies	958	988
Inventories	256	250
Other current assets	38	41
Total current assets	2,303	3,068
Investments		
Investments in related companies	237	237
Other investments	23	22
Noncurrent receivables	91	83
Noncurrent receivables from related companies	61	68
Total investments	412	410
Property		
Property	7,104	7,168
Less accumulated depreciation	5,922	5,960
Net property	1,182	1,208
Other Assets		
Intangible assets (net of accumulated amortization 2022: $100; 2021: $103)	9	13
Operating lease right-of-use assets	107	122
Deferred income tax assets	239	288
Deferred charges and other assets	37	47
Total other assets	392	470
Total Assets	$ 4,289	$ 5,156
Liabilities and Equity		
Current Liabilities		
Notes payable to related companies	$ 51	$ 30
Notes payable - other	4	—
Long-term debt due within one year	132	3
Accounts payable:		
Trade	284	362
Related companies	411	622
Other	16	27
Operating lease liabilities - current	21	20
Income taxes payable	33	25
Asbestos-related liabilities - current	90	85
Accrued and other current liabilities	145	171
Total current liabilities	1,187	1,345
Long-Term Debt	262	392
Other Noncurrent Liabilities		
Pension and other postretirement benefits - noncurrent	298	491
Asbestos-related liabilities - noncurrent	857	931
Operating lease liabilities - noncurrent	87	103
Other noncurrent obligations	254	230
Total other noncurrent liabilities	1,496	1,755
Stockholders' Equity		
Common stock (authorized: 1,000 shares of $0.01 par value each; issued: 935.51 shares)	—	—
Additional paid-in capital	141	141
Retained earnings	2,605	3,074
Accumulated other comprehensive loss	(1,402)	(1,551)
Union Carbide Corporation's stockholders' equity	1,344	1,664
Total Liabilities and Equity	$ 4,289	$ 5,156

See Notes to the Consolidated Financial Statements.

Union Carbide Corporation and Subsidiaries
Consolidated Statements of Cash Flows

(In millions) For the years ended Dec 31,	2022	2021	2020
Operating Activities			
Net income attributable to Union Carbide Corporation	$ 594	$ 375	$ 427
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	199	202	210
Provision for deferred income tax	5	140	46
Net gain on sales of property and investments	(3)	(6)	(271)
Restructuring and asset related charges - net	—	1	15
Net periodic pension benefit cost (credit)	9	(5)	56
Pension contributions	(3)	(549)	(2)
Net loss on early extinguishment of debt	—	—	19
Other, net	—	11	—
Changes in assets and liabilities:			
Accounts and notes receivable	14	(22)	(6)
Related company receivables	658	(24)	(194)
Inventories	(6)	(48)	33
Accounts payable	(89)	132	28
Related company payables	(190)	210	24
Asbestos-related payments	(69)	(82)	(67)
Other assets and liabilities	75	71	(42)
Cash provided by operating activities	1,194	406	276
Investing Activities			
Capital expenditures	(143)	(121)	(135)
Change in noncurrent receivable from related company	7	(2)	—
Proceeds from sales of property	3	7	330
Cash provided by (used for) investing activities	(133)	(116)	195
Financing Activities			
Dividends paid to parent	(1,063)	(288)	(362)
Changes in short-term notes payable	4	—	(6)
Payments on long-term debt	(3)	(2)	(84)
Transaction financing, debt issuance and other costs	—	—	(19)
Cash used for financing activities	(1,062)	(290)	(471)
Summary			
Decrease in cash and cash equivalents	(1)	—	—
Cash and cash equivalents at beginning of year	11	11	11
Cash and cash equivalents at end of year	$ 10	$ 11	$ 11

See Notes to the Consolidated Financial Statements.

Union Carbide Corporation and Subsidiaries

Consolidated Statements of Equity

(In millions) For the years ended Dec 31,	2022	2021	2020
Common Stock			
Balance at beginning and end of period	$ —	$ —	$ —
Additional Paid-in Capital			
Balance at beginning and end of period	141	141	141
Retained Earnings			
Balance at beginning of period	3,074	2,987	2,922
Net income attributable to Union Carbide Corporation	594	375	427
Dividends declared	(1,063)	(288)	(362)
Other	—	—	—
Balance at end of period	2,605	3,074	2,987
Accumulated Other Comprehensive Loss, Net of Tax			
Balance at beginning of period	(1,551)	(1,770)	(1,665)
Other comprehensive income (loss)	149	219	(105)
Balance at end of period	(1,402)	(1,551)	(1,770)
Union Carbide Corporation's Stockholder's Equity	$ 1,344	$ 1,664	$ 1,358

See Notes to the Consolidated Financial Statements.

Union Carbide Corporation and Subsidiaries

Notes to the Consolidated Financial Statements

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NOTE 1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation and Basis of Presentation

Except as otherwise indicated by the context, the terms "Corporation" and "UCC" as used herein mean Union Carbide Corporation and its consolidated subsidiaries. The accompanying consolidated financial statements of the Corporation 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 the Corporation exercises control and, when applicable, entities for which the Corporation has a controlling financial interest. Investments in nonconsolidated affiliates (20-50 percent owned companies, joint ventures and partnerships) are accounted for using the equity method.

The Corporation is a wholly owned subsidiary of The Dow Chemical Company ("TDCC"). In accordance with the accounting guidance for earnings per share, the presentation of earnings per share is not required in financial statements of wholly owned subsidiaries.

TDCC conducts its worldwide operations through global businesses. The Corporation’s business activities comprise components of TDCC’s global businesses rather than stand-alone operations. Because there are no separate reportable business segments for UCC under the accounting guidance related to segment reporting and no detailed business information is provided to a chief operating decision maker regarding the Corporation’s stand-alone operations, the Corporation’s results are reported as a single operating segment.

Intercompany transactions and balances are eliminated in consolidation. Transactions with the Corporation’s parent company, TDCC, and other subsidiaries of TDCC, have been reflected as related company transactions in the consolidated financial statements. See Note 18 for additional information.

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 Corporation'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 "Asbestos-related liabilities - current" and "Asbestos-related liabilities - noncurrent." See Note 13 for additional information.

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

Foreign Currency Translation
While the Corporation's consolidated subsidiaries are primarily based in the United States, the Corporation has small subsidiaries in Asia Pacific and the rest of the world. For those subsidiaries, the local currency has been primarily used as the functional currency. 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"). 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 receivable - Other."

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

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.

The Corporation 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. 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 Corporation 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.

Other Intangible Assets
Finite-lived intangible assets, such as developed technology and software, are amortized over their estimated useful lives, generally on a straight-line basis for periods ranging primarily from three to twenty years.

Investments in Related Companies
Investments in related companies consist of the Corporation's ownership interests in TDCC subsidiaries located in the United States and Latin America. The Corporation accounts for these investments using the cost method as it does not have significant influence over the operating and financial policies of these related companies.

Leases
UCC determines whether a contract contains a lease at contract inception. A contract contains a lease if there is an identified asset and the Corporation has the right to control the asset. Operating lease right-of-use (“ROU”) assets represent UCC’s right to use an underlying asset for the lease term, and lease liabilities represent UCC’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. UCC 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.

UCC 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 UCC 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 14 for additional information.

Revenue
Substantially all of the Corporation's revenues are generated by sales to TDCC. Revenue for product sales to related companies is recognized when the related company obtains control of the product, which occurs either at the time that production is complete or shipped free on board ("FOB") from UCC's manufacturing facility, in accordance with the sales agreement between the Corporation and TDCC. The Corporation recognizes revenue for product sales to trade customers when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the Corporation expects to receive in exchange for those goods or services. To determine revenue recognition, the Corporation 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 3 for additional information.

Severance Costs
Management routinely reviews its operations around the world in an effort to ensure competitiveness across its operations 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 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.

Income Taxes
The Corporation 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 Corporation is included in the same consolidated federal income tax group and consolidated income tax return as TDCC. The Corporation accounts for its income taxes following the formula in the TDCC-UCC Tax Sharing Agreement used to compute the amount due to TDCC or UCC for UCC's share of taxable income and tax attributes on the consolidated income tax return. This method generally follows the separate return method. The amounts reported as income taxes payable or receivable represent the Corporation's payment obligation (or refundable amount) to TDCC based on a theoretical tax liability calculated on a separate return method.

The Corporation 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 Corporation accrues for non-income 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.

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.

NOTE 2 - RECENT ACCOUNTING GUIDANCE

Recently Adopted Accounting Guidance
In the first quarter of 2021, the Corporation adopted Accounting Standards Update ("ASU") 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.

Accounting Guidance Issued But Not Adopted at December 31, 2022
In September 2022, the Financial Accounting Standards Board issued ASU 2022-04, "Liabilities — Supplier Finance Programs (Subtopic 405-50): Disclosure of Supplier Finance Program Obligations," which requires disclosures intended to enhance the transparency of supplier finance programs. The amendments in this ASU require buyers in a supplier finance program to disclose sufficient information about the program to allow a user of financial statements to understand the program’s nature, activity during the period, changes from period to period, and potential magnitude. The amendments are effective for fiscal years beginning after December 15, 2022, including interim periods within those fiscal years, except for the disclosure of rollforward information, which is effective for fiscal years beginning after December 15, 2023. Early adoption is permitted. The amendments should be applied retrospectively to each period in which a balance sheet is presented, except for disclosure of rollforward information,

which should be applied prospectively. The ASU only requires disclosures related to the Corporation's supplier finance programs and does not affect the recognition, measurement or financial statement presentation of supplier finance program obligations. The Corporation expects to adopt the new disclosure requirements in the first quarter of 2023, with the exception of the annual requirement to disclose rollforward information, which the Corporation expects to early adopt and present prospectively beginning in the 2023 annual financial statements.

NOTE 3 - REVENUE

Substantially all of the Corporation's revenue is generated by sales of products, primarily to TDCC. Products are sold to and purchased from TDCC at prices determined in accordance with the terms of an agreement between UCC and TDCC. The Corporation sells its products to TDCC to simplify the customer interface process.

Substantially all product sale contracts are short-term in nature and have original expected durations of one year or less. Revenue from product sales is recognized when TDCC or the trade customer obtains control of the Corporation's product, which occurs at a point in time, typically at the time production is complete or product is shipped FOB from UCC's manufacturing facility for sales to TDCC, or upon shipment for sales to trade customers. The Corporation's payment terms are on average 30 to 60 days after invoicing. All shipping and handling activities that occur after control transfers to the customer are considered fulfillment activities. Certain long-term contracts include a series of distinct goods that are delivered continuously to the customer through a pipeline. For these types of product sales, the Corporation invoices the customer in an amount that directly corresponds with the value to the customer of the Corporation's performance to date. As a result, revenue is recognized based on the amount billable to the customer in accordance with the right to invoice practical expedient.

The transaction price for product sales includes estimates for the most likely amount of consideration to which the Corporation will be entitled based on historical award experience and the Corporation's best judgment at the time. Taxes collected and remitted to governmental authorities are excluded from the transaction price. For contracts with multiple performance obligations, the Corporation allocates the transaction price to each performance obligation on the basis of relative standalone selling price, which is based on the price charged to customers or estimated using the expected cost plus margin method.

Revenue related to the initial licensing of patents and technology is recognized when the performance obligation is satisfied. Revenue related to sales-based royalties to which the Corporation expects to be entitled is estimated based on historical sales.

The Corporation's contract liabilities include payments received in advance of performance under long-term contracts for product sales and royalties with remaining contract terms that range up to 18 years. Amounts are recognized in revenue when the performance obligations for the contract are met. The Corporation has rights to additional consideration when product is delivered to the customer. The balance of contract liabilities was $33 million at December 31, 2022 ($35 million at December 31, 2021), of which $2 million ($2 million at December 31, 2021) was included in "Accrued and other current liabilities" and $31 million ($33 million at December 31, 2021) was included in "Other noncurrent obligations" in the consolidated balance sheets.

The Corporation disaggregates its revenue from contracts with customers by type of customer (sales to related parties and sales to trade customers) as presented on the consolidated statements of income and believes this disaggregation best depicts the nature, amount, timing and uncertainty of its revenue and cash flows. Substantially all of the product sales are made to the Corporation's parent company, TDCC, and there are no unique economic factors that affect revenue recognition and cash flows associated with these product sales.

NOTE 4 - DIVESTITURES

Divestiture of Rail Infrastructure Operations and Assets

On July 2, 2020, TDCC entered into a definitive agreement to sell its rail infrastructure operations and assets at certain sites in the U.S. and Canada to an affiliate of Watco Companies, L.L.C. ("Watco affiliate") and the transaction closed September 30, 2020. As part of this transaction, UCC sold certain related operations and assets, including existing agreements to provide rail services to unrelated third parties, located at its sites in St. Charles, Louisiana ("St. Charles"), and Seadrift, Texas, with a net book value of $9 million, to the Watco affiliate. UCC retained ownership of the sites and underlying real property where the divested operations are located. UCC and the Watco affiliate entered into mutual long-term service agreements designed to ensure the continuation of rail services for UCC's existing operations at the impacted sites. The rail-service agreements include variable fees that have an initial term of 25 years. As part of the sale, UCC received proceeds of $95 million from TDCC, subject to customary post-closing adjustments, and recognized a pretax gain on the sale of $86 million, included in "Sundry income (expense) - net" in the consolidated statements of income. See Note 18 for more information on the cash management process.

The Corporation 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 Corporation’s operations and financial results and did not qualify as an individually significant component of the Corporation. As a result, the divestiture is not reported as discontinued operations.

Divestiture of Marine and Terminal Operations and Assets

On September 14, 2020, TDCC entered into a definitive agreement to sell certain U.S. Gulf Coast marine and terminal operations and assets, including certain operations and assets located at UCC's site in St. Charles, to an affiliate of Royal Vopak ("Vopak affiliate"), and the transaction closed December 1, 2020. As part of this transaction, UCC sold certain related operations and assets located at its St. Charles site, including existing agreements to provide marine and terminal services to unrelated third parties, with a net book value of $41 million to the Vopak affiliate. UCC retained ownership of the site and the underlying real property where the divested operations are located. UCC and the Vopak affiliate entered into mutual long-term service agreements designed to ensure the continuation of marine and terminal services for UCC's existing St. Charles operations. The marine and terminal service agreements include fixed and variable fees that have initial terms of up to 25 years. Certain of these agreements contain leases, resulting in operating lease ROU assets and lease liabilities of $38 million. As part of the sale, UCC received proceeds of $226 million from TDCC, subject to customary post-closing adjustments, and recognized a pretax gain on the sale of $185 million, included in "Sundry income (expense) - net" in the consolidated statements of income. See Note 14 for additional information related to leases and Note 18 for additional information on the cash management process.

The Corporation 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 Corporation’s operations and financial results and did not qualify as an individually significant component of the Corporation. As a result, the divestiture is not reported as discontinued operations.

NOTE 5 - RESTRUCTURING AND ASSET RELATED CHARGES - NET

2020 Restructuring Program

On September 30, 2020, the Corporation's Board of Directors (the "Board") approved restructuring actions that were aligned to the structural cost improvement initiatives announced by Dow Inc. in response to the continued economic impact from the pandemic caused by coronavirus disease 2019 ("COVID-19") ("2020 Restructuring Program"). The restructuring program was designed to reduce structural costs and enable the Corporation to further enhance competitiveness while the COVID-19 economic recovery gained traction. This program included workforce cost reductions and actions to rationalize the Corporation's manufacturing assets. These actions were substantially complete at the end of 2021.

In 2020, the Corporation recorded pretax restructuring charges of $13 million, consisting of severance and related benefit costs of $9 million and asset write-downs and write-offs of $4 million. In 2021, the Corporation recorded a pretax restructuring charge of $1 million for additional severance and related benefit costs. The Corporation paid $9 million for severance and related benefit costs in 2021 and $1 million in 2022.

Cumulative pretax restructuring charges recorded under the 2020 Restructuring Program were $14 million, consisting of severance and related benefit costs of $10 million and asset write-downs and write-offs of $4 million.

The Corporation 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 plan implementation costs; these costs will be recognized as incurred. The Corporation 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.

NOTE 6 - SUPPLEMENTARY INFORMATION

Sundry Income (Expense) - Net In millions	2022	2021	2020
TDCC administrative and overhead fees [1]	$ (65)	$ (63)	$ (31)
Net commission expense - related company [1]	(19)	(21)	(22)
Non-operating pension and other postretirement benefit plan net credits (costs) [2]	34	32	(20)
Net gain on sales of property	3	6	—
Gain on divestiture of marine and terminal operations and assets [3]	—	—	185
Gain on divestiture of rail infrastructure operations and assets [3]	—	—	86
Loss on early extinguishment of debt [4]	—	—	(19)
Other - net	(6)	(7)	(11)
Total sundry income (expense) - net	$ (53)	$ (53)	$ 168

1. See Note 18 for additional information.
2. See Note 16 for additional information.
3. See Note 4 for additional information.
4. See Note 12 for additional information.

Supplemental Cash Flow Information

The following table shows cash paid (refunded) for interest and income taxes for the years ended December 31, 2022, 2021 and 2020:

Supplemental Cash Flow Information In millions	2022	2021	2020
Cash paid (refunded) during year for:			
Interest	$ 31	$ 31	$ 41
Income taxes	$ 63	$ (62)	$ 93

NOTE 7 - INCOME TAXES

Geographic Allocation of Income and Provision for Income Taxes In millions	2022	2021	2020
Income (loss) before income taxes			
Domestic	$ 767	$ 531	$ 558
Foreign	(1)	(2)	(1)
Income before income taxes	$ 766	$ 529	$ 557
Current tax expense (benefit)			
Federal	$ 157	$ (11)	$ 82
State and local	9	5	2
Foreign	1	20	—
Total current tax expense	$ 167	$ 14	$ 84
Deferred tax expense (benefit)			
Federal	$ (2)	$ 122	$ 42
State and local	3	23	4
Foreign	4	(5)	—
Total deferred tax expense	$ 5	$ 140	$ 46
Provision for income taxes	$ 172	$ 154	$ 130
Net income	$ 594	$ 375	$ 427

Reconciliation to U.S. Statutory Rate	2022	2021	2020
Statutory U.S. federal income tax rate	21.0 %	21.0 %	21.0 %
Unrecognized tax benefits	(0.7)	3.0	(0.9)
Federal tax accrual adjustments	0.7	—	3.0
State and local tax impact	1.7	5.3	0.2
Other - net	(0.2)	(0.2)	—
Effective Tax Rate [1]	22.5 %	29.1 %	23.3 %

1. The tax rate for 2022 was unfavorably impacted by state and local tax charges. In 2021, the Corporation recognized additional charges related to state and local jurisdictions and an uncertain tax position related to litigation in a foreign jurisdiction which negatively impacted the effective tax rate. The tax rate for 2020 was unfavorably impacted by an accrual-to-return adjustment.

Deferred Tax Balances at Dec 31	2022		2021	
In millions	Assets	Liabilities	Assets	Liabilities
Property	$ —	$ 154	$ —	$ 167
Tax loss and credit carryforwards	26	—	23	—
Postretirement benefit obligations	72	—	119	—
Other accruals and reserves	293	3	313	6
Inventory	2	—	—	—
Other - net	18	—	18	—
Subtotal	$ 411	$ 157	$ 473	$ 173
Valuation allowances [1]	(15)	—	(12)	—
Total	$ 396	$ 157	$ 461	$ 173

1. Primarily related to the realization of recorded tax benefits on state tax loss carryforwards from operations in the United States.

Operating Loss and Tax Credit Carryforwards at Dec 31	2022	2021
In millions	Assets	Assets
Operating loss carryforwards		
Expire within 5 years	$ 8	$ 11
Expire after 5 years or indefinite expiration	12	7
Total operating loss carryforwards	$ 20	$ 18
Tax credit carryforwards		
Expire within 5 years	$ 5	$ 5
Expire after 5 years or indefinite expiration	1	—
Total tax credit carryforwards	$ 6	$ 5
Total tax loss and tax credit carryforwards	$ 26	$ 23

Undistributed earnings of foreign subsidiaries and related companies that are deemed to be permanently invested were zero at December 31, 2022 ($7 million at December 31, 2021). The unrecognized deferred tax liability on those earnings was not material.

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

Total Gross Unrecognized Tax Benefits In millions	*2022*	*2021*	*2020*
Total unrecognized tax benefits at Jan 1	$ 8	$ 1	$ 1
Decreases related to positions taken on items from prior years	—	(1)	—
Increases related to positions taken on items from prior years	—	8	—
Total unrecognized tax benefits at Dec 31	$ 8	$ 8	$ 1
Total unrecognized tax benefits that, if recognized, would impact the effective tax rate	$ 8	$ 8	$ 1
Total amount of interest and penalties (benefit) recognized in "Provision for income taxes"	$ (10)	$ 11	$ (5)
Total accrual for interest and penalties recognized in the consolidated balance sheets	$ 10	$ 12	$ —

During 2021, the Corporation recorded an uncertain tax position related to a foreign jurisdiction.

The Corporation is included in TDCC's consolidated federal income tax group. Current and deferred tax expenses are calculated for the Corporation as a stand-alone group and are allocated to the group from the consolidated totals, consistent with the TDCC-UCC Tax Sharing Agreement. The Corporation is currently under examination in a number of tax jurisdictions, including the U.S. federal and various state jurisdictions. It is reasonably possible that these examinations may be resolved in the next twelve months. The impact on the Corporation’s results of operations is not expected to be material. The earliest open tax years are 2004 for state income taxes and 2007 for federal income taxes in the United States.

Inherent uncertainties exist in estimates of tax contingencies due to changes in tax law, both legislated and concluded through the various jurisdictions' tax court systems. It is the opinion of the Corporation's management that the possibility is remote that costs in excess of those accrued will have a material impact on the Corporation's consolidated financial statements.

NOTE 8 - INVENTORIES

The following table provides a breakdown of inventories:

Inventories at Dec 31 In millions	*2022*	*2021*
Finished goods	$ 218	$ 238
Work in process	37	33
Raw materials	76	59
Supplies	87	76
Total	$ 418	$ 406
Adjustment of inventories to the LIFO basis	(162)	(156)
Total inventories	$ 256	$ 250

Inventories valued on the LIFO basis, principally U.S. chemicals and plastics product inventories, represented 65 percent of the total inventories at December 31, 2022 and 64 percent of the total inventories at December 31, 2021.

NOTE 9 - PROPERTY

The following table provides a breakdown of property:

Property at Dec 31 In millions	*Estimated Useful Lives (Years)*		*2022*		*2021*
Land and land improvements	0-25	$	186	$	190
Buildings	5-50		403		420
Machinery and equipment	3-20		5,993		6,090
Other property	3-30		383		377
Construction in progress	—		139		91
Total property		$	7,104	$	7,168

The following table provides information regarding depreciation expense and capitalized interest:

In millions		*2022*		*2021*		*2020*
Depreciation expense	$	165	$	167	$	181
Capitalized interest	$	5	$	5	$	6

NOTE 10 - INVESTMENTS IN RELATED COMPANIES

The Corporation's ownership interests in related companies at December 31, 2022 and 2021 were as follows:

Investments in Related Companies at Dec 31	*Ownership Interest*				
In millions	*2022*	*2021*		*Investment Balance 2022*	*Investment Balance 2021*
Dow International Holdings Company	5 %	5 %	$	232	$ 232
Dow Quimica Mexicana S.A. de C.V.	14 %	14 %		5	5
Total investments in related companies			$	237	$ 237

NOTE 11 - INTANGIBLE ASSETS

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

Intangible Assets at Dec 31	2022			2021		
In millions	Gross Carrying Amount	Accum Amort	Net	Gross Carrying Amount	Accum Amort	Net
Intangible assets with finite lives:						
Developed technology	$ 33	$ (33)	$ —	$ 33	$ (33)	$ —
Software	76	(67)	9	83	(70)	13
Total intangible assets	$ 109	$ (100)	$ 9	$ 116	$ (103)	$ 13

The following table provides information regarding amortization expense:

Amortization Expense In millions	2022	2021	2020
Software, included in "Cost of sales"	$ 5	$ 6	$ 8

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

Estimated Amortization Expense for Next Five Years In millions	
2023	$ 4
2024	$ 3
2025	$ 2
2026	$ 1
2027	$ 1

NOTE 12 - NOTES PAYABLE AND LONG-TERM DEBT

Notes Payable at Dec 31 In millions	*2022*	*2021*
Notes payable to related companies	$ 51	$ 30
Notes payable - other	4	—
Total notes payable	$ 55	$ 30
Year-end average interest rates	1.02 %	1.43 %

Long-Term Debt at Dec 31 In millions	*2022 Average Rate*	*2022*	*2021 Average Rate*	*2021*
Promissory notes and debentures:				
Debentures due 2023	7.875 %	$ 129	7.875 %	$ 129
Debentures due 2025	6.79 %	12	6.79 %	12
Debentures due 2025	7.50 %	113	7.50 %	113
Debentures due 2096	7.75 %	135	7.75 %	135
Finance lease obligations [1]		7		9
Unamortized debt discount and issuance costs		(2)		(3)
Long-term debt due within one year		(132)		(3)
Total long-term debt		$ 262		$ 392

1. See Note 14 for additional information.

Maturities of Long-Term Debt for Next Five Years at Dec 31, 2022 In millions	
2023	$ 132
2024	$ 3
2025	$ 127
2026	$ —
2027	$ —

2020 Activity
In 2020, TDCC concluded a cash tender offer that included $83 million aggregate principal amount of certain notes issued by the Corporation. As a result of the tender offer, the Corporation retired $46 million of 7.875 percent notes due 2023 and $37 million of 7.50 percent notes due 2025 and recognized a $19 million loss on the early extinguishment of debt, included in "Sundry income (expense) - net" in the consolidated statements of income.

Letters of Credit
The Corporation utilizes letters of credit to support commitments made in the ordinary course of business. While the terms and amounts of letters of credit change, UCC generally has approximately $6 million of outstanding letters of credit at any given time.

Debt Covenants and Default Provisions
The Corporation's outstanding public debt has been issued under indentures which contain, among other provisions, covenants that the Corporation must comply with while the underlying notes are outstanding. Such covenants are typically based on the Corporation's size and financial position and include, subject to the exceptions and qualifications contained in the indentures, obligations not to (i) allow liens on principal U.S. manufacturing facilities, (ii) enter into sale and lease-back transactions with respect to principal U.S. manufacturing facilities, or (iii) merge into or consolidate with any other entity or sell or convey all or substantially all of its assets. Failure of the Corporation to comply with any of these covenants could, after the passage of any applicable grace period, result in a default under the applicable indenture which would allow the note holders to accelerate the due date of the outstanding principal and accrued interest on the subject notes.

NOTE 13 - COMMITMENTS AND CONTINGENCIES

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.

At December 31, 2022, the Corporation had accrued obligations of $183 million for probable environmental remediation and restoration costs ($148 million at December 31, 2021), including $36 million for the remediation of Superfund sites ($23 million at December 31, 2021). This is management's best estimate of the costs for remediation and restoration with respect to environmental matters for which the Corporation 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 Corporation's results of operations, financial condition and cash flows. It is the opinion of the Corporation's management, however, that the possibility is remote that costs in excess of the range disclosed will have a material impact on the Corporation's results of operations, financial condition and cash flows. Inherent uncertainties exist in these estimates primarily due to unknown environmental 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.

The following table summarizes the activity in the Corporation's accrued obligations for environmental matters for the years ended December 31, 2022 and 2021:

Accrued Liability for Environmental Matters In millions	*2022*	*2021*
Balance at Jan 1	$ 148	$ 133
Accrual adjustment	78	47
Payments against reserve	(42)	(31)
Foreign currency impact	(1)	(1)
Balance at Dec 31	$ 183	$ 148

The amounts charged to income on a pretax basis related to environmental remediation totaled $72 million in 2022, $47 million in 2021 and $49 million in 2020. Capital expenditures for environmental protection were $38 million in 2022, $8 million in 2021 and $5 million in 2020.

Litigation

Asbestos-Related Matters

Introduction

The Corporation 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 UCC sold in the past, alleged exposure to asbestos-containing products located on UCC's premises and UCC's responsibility for asbestos suits filed against a former UCC 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 the Corporation's products. The Corporation expects more asbestos-related suits to be filed against UCC and Amchem in the future, and will aggressively defend or reasonably resolve, as appropriate, both pending and future claims.

Estimating the Asbestos-Related Liability

The Corporation has engaged Ankura Consulting Group, LLC ("Ankura") to perform periodic studies to estimate the undiscounted cost of disposing of pending and future claims against UCC and Amchem through the terminal year of 2049, including a reasonable forecast of future defense and processing costs. Each October, the Corporation 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. At each balance sheet date, the Corporation also compares current asbestos claim and resolution activity, including asbestos-related defense and processing costs, to the results of the most recent Ankura study to determine whether the accrual continues to be appropriate.

In December 2020, Ankura completed a study of the Corporation'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 UCC and Amchem through the terminal year of 2049. Based on the study and the Corporation's internal review process, it was determined that no adjustment to the accrual was required.

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 the Corporation's internal review process and Ankura's response, the Corporation determined that no change to the accrual was required. At December 31, 2021, the asbestos-related liability for pending and future claims against UCC 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.

In December 2022, Ankura completed a study of the Corporation's historical asbestos claim and resolution activity through September 30, 2022, including asbestos-related defense and processing costs, and provided estimates for the undiscounted cost of disposing of pending and future claims against UCC and Amchem through the terminal year of 2049. Based on the study and the Corporation's internal review process, it was determined that no adjustment to the accrual was required. At December 31, 2022, the asbestos-related liability for pending and future claims against UCC and Amchem, including future asbestos-related defense and processing costs, was $947 million, and approximately 23 percent of the recorded liability related to pending claims and approximately 77 percent related to future claims.

Summary

The Corporation's management believes the amounts recorded for the asbestos-related liability, including defense and processing costs, reflect reasonable and probable estimates of the liability based on 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 the Corporation to be higher or lower than those projected or those recorded. Any such event could result in an increase or decrease in the recorded liability.

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

Other Litigation

The Corporation is also involved in a number of legal proceedings and claims with both private and governmental parties. These cover a wide range of matters, including, but not limited to: product liability; trade regulation; governmental tax and regulatory disputes; health, safety and environmental matters; employment matters; patent infringement; contracts; and commercial litigation. While it is not possible at this time to determine with certainty the ultimate outcome of any of the legal proceedings and claims referred to in this filing, management believes 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, cash flows and financial position of the Corporation.

Purchase Commitments

The Corporation has outstanding purchase commitments and various commitments for take-or-pay or throughput agreements. The Corporation 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, 2022 and 2021.

NOTE 14 - LEASES

Operating lease ROU assets are included in "Operating lease right-of-use assets" and 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.

The Corporation routinely leases product and utility production facilities, sales and administrative offices, warehouses and tanks for product storage, motor vehicles, railcars, computers, office machines and equipment. Some leases contain renewal provisions, purchase options and escalation clauses. The terms for these leased assets vary depending on the lease agreement. These leased assets have remaining lease terms of up to 18 years. The Corporation's lease agreements do not contain any material residual value guarantees or restrictive covenants.

The components of lease cost for operating and finance leases for the years ended December 31, 2022, 2021 and 2020 were as follows:

Lease Cost In millions	*2022*	*2021*	*2020*
Operating lease cost	$ 25	$ 23	$ 20
Short-term lease cost	31	28	22
Variable lease cost	19	39	8
Amortization of right-of-use assets - finance	3	3	2
Total lease cost	$ 78	$ 93	$ 52

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

Other Lease Information In millions	*2022*	*2021*	*2020*
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash flows for operating leases	$ 25	$ 23	$ 19
Financing cash flows for finance leases	$ 3	$ 3	$ 2
Right-of-use assets obtained in exchange for lease obligations:			
Operating leases	$ 2	$ 15	$ 48
Finance leases	$ 1	$ 5	$ 3

The following table summarizes the lease-related assets and liabilities recorded in the consolidated balance sheets at December 31, 2022 and 2021:

Lease Position In millions	*Balance Sheet Classification*	*Dec 31, 2022*	*Dec 31, 2021*
Assets			
Operating lease assets	Operating lease right-of-use assets	$ 107	$ 122
Finance lease assets	Property	20	19
Finance lease amortization	Accumulated depreciation	(13)	(11)
Total lease assets		$ 114	$ 130
Liabilities			
Current			
Operating	Operating lease liabilities - current	$ 21	$ 20
Finance	Long-term debt due within one year	3	3
Noncurrent			
Operating	Operating lease liabilities - noncurrent	87	103
Finance	Long-Term Debt	4	6
Total lease liabilities		$ 115	$ 132

The weighted-average remaining lease term and discount rate for leases recorded in the consolidated balance sheets at December 31, 2022 and 2021 are provided below:

Lease Term and Discount Rate	*Dec 31, 2022*	*Dec 31, 2021*
Weighted-average remaining lease term		
Operating leases	6.3 years	7.1 years
Finance leases	2.5 years	3.1 years
Weighted-average discount rate		
Operating leases	3.43 %	3.17 %
Finance leases	2.33 %	2.53 %

The following table provides the maturities of lease liabilities at December 31, 2022:

Maturities of Lease Liabilities	*Dec 31, 2022*	
In millions	*Operating Leases*	*Finance Leases*
2023	$ 24	$ 3
2024	23	3
2025	21	2
2026	20	—
2027	9	—
2028 and thereafter	22	—
Total future undiscounted lease payments	$ 119	$ 8
Less: Imputed interest	11	1
Total present value of lease liabilities	$ 108	$ 7

At December 31, 2022, the Corporation had no additional leases for assets that have not yet commenced.

NOTE 15 - ACCUMULATED OTHER COMPREHENSIVE LOSS

The changes in each component of AOCL for the years ended December 31, 2022, 2021 and 2020 were as follows:

Accumulated Other Comprehensive Loss In millions	*2022*	*2021*	*2020*
Cumulative Translation Adjustment			
Beginning balance	$ (53)	$ (55)	$ (56)
Unrealized gains (losses) on foreign currency translation	—	2	—
(Gains) losses reclassified from AOCL to net income [1]	(1)	—	1
Other comprehensive income (loss), net of tax	(1)	2	1
Ending balance	$ (54)	$ (53)	$ (55)
Pension and Other Postretirement Benefits			
Beginning balance	$ (1,498)	$ (1,715)	$ (1,609)
Gains (losses) arising during the period	96	180	(242)
Tax (expense) benefit	(22)	(43)	57
Net gains (losses) arising during the period	74	137	(185)
Amortization of net loss and prior service credit reclassified from AOCL to net income [2]	98	104	103
Tax expense (benefit) [3]	(22)	(24)	(24)
Net loss and prior service credit reclassified from AOCL to net income	76	80	79
Other comprehensive income (loss), net of tax	150	217	(106)
Ending balance	$ (1,348)	$ (1,498)	$ (1,715)
Total AOCL ending balance	$ (1,402)	$ (1,551)	$ (1,770)

1. Reclassified to "Sundry income (expense) - net."
2. These AOCL components are included in the computation of net periodic benefit cost of the Corporation's defined benefit pension and other postretirement benefit plans. See Note 16 for additional information.
3. Reclassified to "Provision for income taxes."

NOTE 16 - PENSION PLANS AND OTHER POSTRETIREMENT BENEFITS

Pension Plans

The Corporation has a defined benefit pension plan that covers substantially all employees in the United States. Benefits are based on length of service and the employee's three highest consecutive years of compensation. Employees hired on or after January 1, 2008, earn benefits that are based on a set percentage of annual pay, plus interest. The Corporation also has a non-qualified supplemental pension plan.

On March 4, 2021, TDCC announced changes to the design of its U.S. tax-qualified and non-qualified pension plans, including the plans of the Corporation (the “UCC Plans”). Effective December 31, 2023 (“Effective Date”), the Corporation will freeze the pensionable compensation and credited service amounts used to calculate pension benefits for employees who participate in the UCC Plans. As a result, at the Effective Date and subject to any bargaining obligations required by law, active participants of the UCC Plans will not accrue additional benefits for future service and compensation. In connection with these plan amendments, the Corporation remeasured the UCC Plans effective February 28, 2021, which resulted in a pretax actuarial gain of $87 million, reflected in other comprehensive income and inclusive of a $14 million reduction in the projected benefit obligation resulting from the plan amendments, and a pretax curtailment gain of $7 million, recognized in the first quarter of 2021.

The Corporation's funding policy is to contribute to the plan when pension laws or economics either require or encourage funding. In 2022, UCC contributed $3 million to its pension plans, including contributions to fund benefit payments for its non-qualified supplemental plan. UCC expects to contribute approximately $2 million to its pension plans in 2023.

The weighted-average assumptions used to determine pension plan obligations and net periodic benefit costs are provided below:

Pension Plan Assumptions	*Benefit Obligations at Dec 31*		*Net Periodic Benefit Costs for the Year Ended*		
	2022	*2021*	*2022*	*2021*	*2020*
Discount rate	5.60 %	2.94 %	2.94 %	2.86 %	3.29 %
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			6.80 %	6.80 %	6.80 %

Other Postretirement Benefit Plans
The Corporation provides certain health care and life insurance benefits to retired U.S. employees and survivors. The plan provides health care benefits, including hospital, physicians' services, drug and major medical expense coverage and life insurance benefits. The Corporation and the retiree share the cost of these benefits, with the Corporation portion increasing as the retiree has increased years of credited service, although there is a cap on the Corporation portion. The Corporation has the ability to change these benefits at any time. Employees hired after January 1, 2008, are not covered under this plan.

The Corporation funds most of the cost of these health care and life insurance benefits as incurred. In 2022, UCC did not make any contributions to its other postretirement benefit plan trust. Likewise, UCC does not expect to contribute assets to its other postretirement benefit plan trust in 2023.

The weighted-average assumptions used to determine other postretirement benefit plan obligations and net periodic benefit costs for the plan are provided in the following table:

Other Postretirement Benefit Plan Assumptions	*Benefit Obligations at Dec 31*		*Net Periodic Benefit Costs for the Year Ended*		
	2022	*2021*	*2022*	*2021*	*2020*
Discount rate	5.56 %	2.84 %	2.84 %	2.34 %	3.17 %
Health care cost trend rate assumed for next year	6.57 %	6.50 %	6.50 %	6.75 %	6.25 %
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	2033	2028	2028	2028	2025

Assumptions
The Corporation 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 Corporation's historical experience with the pension fund asset performance is also considered.

The Corporation 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. Under the spot rate approach, the Corporation calculates service cost and interest cost by applying individual spot rates from 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 the separate expected cash flow components of service cost and interest cost.

The discount rates utilized to measure the pension and other postretirement obligations of the plans were based on the yield on high-quality corporate fixed income investments at the measurement date. Future expected actuarially determined cash flows for the 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 Corporation's mortality assumption used for the U.S. 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 Corporation's pension and other postretirement benefit plans is as follows:

Change in Projected Benefit Obligations, Plan Assets and Funded Status for All Plans	*Defined Benefit Pension Plans*		*Other Postretirement Benefit Plan*	
In millions	*2022*	*2021*	*2022*	*2021*
Change in projected benefit obligations:				
Benefit obligations at beginning of year	$ 3,940	$ 4,229	$ 174	$ 220
Service cost	37	26	1	1
Interest cost	91	80	3	3
Actuarial changes in assumptions and experience	(826)	(112)	(48)	(37)
Benefits paid	(265)	(263)	(2)	(13)
Curtailments/other [1]	(117)	(20)	—	—
Benefit obligations at end of year	$ 2,860	$ 3,940	$ 128	$ 174
Change in plan assets:				
Fair value of plan assets at beginning of year	$ 3,611	$ 3,095	$ —	$ —
Actual return on plan assets	(556)	236	—	—
Employer contributions	3	549	—	—
Asset transfers	(8)	(8)	—	—
Benefits paid	(265)	(263)	—	—
Other [2]	(106)	2	—	—
Fair value of plan assets at end of year	$ 2,679	$ 3,611	$ —	$ —
Funded status at end of year	$ (181)	$ (329)	$ (128)	$ (174)
Net amounts recognized in the consolidated balance sheets at Dec 31:				
Accrued and other current liabilities	$ (2)	$ (2)	$ (12)	$ (13)
Pension and other postretirement benefits - noncurrent	(179)	(327)	(116)	(161)
Net amount recognized	$ (181)	$ (329)	$ (128)	$ (174)
Pretax amounts recognized in accumulated other comprehensive loss at Dec 31:				
Net loss (gain)	$ 1,852	$ 2,007	$ (124)	$ (84)
Prior service credit	—	(1)	—	—
Pretax balance in accumulated other comprehensive loss at end of year	$ 1,852	$ 2,006	$ (124)	$ (84)

1. The 2022 impact primarily relates to the transfer of benefit obligations through the purchase of an annuity contract from an insurance company. The 2021 impact primarily relates to the freeze of pensionable compensation and credited service amounts for employees that participate in the UCC Plans.
2. The 2022 impact relates to the purchase of an annuity contract associated with the transfer of benefit obligations to an insurance company.

A significant component of the overall decrease in the Corporation's benefit obligation for the year ended December 31, 2022 was due to the change in weighted-average discount rates, which increased from 2.94 percent at December 31, 2021 to 5.60 percent at December 31, 2022. A significant component of the overall decrease in the Corporation's benefit obligation for the year ended December 31, 2021 was due to the change in weighted-average discount rates, which increased from 2.53 percent at December 31, 2020 to 2.94 percent at December 31, 2021.

The accumulated benefit obligation for all defined benefit pension plans was $2.9 billion at December 31, 2022 and $3.9 billion at December 31, 2021.

Pension Plans with Accumulated Benefit Obligations in Excess of Plan Assets at Dec 31 In millions	*2022*	*2021*
Accumulated benefit obligations	$ 2,859	$ 3,935
Fair value of plan assets	$ 2,679	$ 3,611

Pension Plans with Projected Benefit Obligations in Excess of Plan Assets at Dec 31 In millions	*2022*	*2021*
Projected benefit obligations	$ 2,860	$ 3,940
Fair value of plan assets	$ 2,679	$ 3,611

Net Periodic Benefit Cost (Credit) for All Plans for the Year Ended Dec 31	*Defined Benefit Pension Plans*			*Other Postretirement Benefit Plan*		
In millions	*2022*	*2021*	*2020*	*2022*	*2021*	*2020*
Net Periodic Benefit Cost (Credit):						
Service cost	$ 37	$ 26	$ 35	$ 1	$ 1	$ 1
Interest cost	91	80	112	3	3	5
Expected return on plan assets	(226)	(219)	(200)	—	—	—
Amortization of prior service credit	(1)	(1)	(1)	—	—	—
Amortization of net (gain) loss	108	116	110	(9)	(4)	(6)
Curtailment gain[1]	—	(7)	—	—	—	—
Net periodic benefit cost (credit)	$ 9	$ (5)	$ 56	$ (5)	$ —	$ —
Changes in plan assets and benefit obligations recognized in other comprehensive (income) loss:						
Net (gain) loss	$ (47)	$ (144)	$ 240	$ (49)	$ (36)	$ 2
Amortization of prior service credit	1	1	1	—	—	—
Amortization of net gain (loss)	(108)	(116)	(110)	9	4	6
Curtailment gain[1]	—	7	—	—	—	—
Total recognized in other comprehensive (income) loss	$ (154)	$ (252)	$ 131	$ (40)	$ (32)	$ 8
Total recognized in net periodic benefit cost and other comprehensive (income) loss	$ (145)	$ (257)	$ 187	$ (45)	$ (32)	$ 8

1. The 2021 impact relates primarily to the freeze of pensionable compensation and credited service amounts for employees that participate in the UCC Plans.

Net periodic benefit cost (credit), other than the service cost component, is included in "Sundry income (expense) - net" in the consolidated statements of income. See Note 6 for additional information.

Estimated Future Benefit Payments
The estimated future benefit payments, reflecting expected future service, as appropriate, are presented in the following table:

Estimated Future Benefit Payments at Dec 31, 2022 In millions	*Defined Benefit Pension Plans*	*Other Postretirement Benefit Plan*
2023	$ 265	$ 12
2024	240	12
2025	236	12
2026	233	12
2027	229	12
2028 through 2032	1,071	49
Total	$ 2,274	$ 109

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 other absolute return strategies. Plan assets totaled $2.7 billion at December 31, 2022 and $3.6 billion at December 31, 2021 and included no directly held common stock of Dow Inc.

The Corporation'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 plan.

The plan is permitted to use derivative instruments for investment purposes, as well as for hedging the underlying asset and liability exposures and rebalancing the asset allocation. The plan uses value-at-risk, stress testing, scenario analysis and Monte Carlo simulation to monitor and manage both the risk within the portfolios and the surplus risk of the plan.

Equity securities primarily include investments in large- and small-cap companies located in both developed and emerging markets around the world. Fixed income securities are primarily U.S. dollar based and include U.S. treasuries and investment grade corporate bonds of companies diversified across industries. 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 Corporation 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 Corporation and the 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 pension plan, which from time to time can represent a significant investment.

The weighted-average target allocation for plan assets of the Corporation's pension plan is summarized as follows:

Target Allocation for Plan Assets at Dec 31, 2022 *Asset Category*	*Target Allocation*
Equity securities	23 %
Fixed income securities	45
Alternative investments	27
Other	5
Total	100 %

Fair value calculations may not be indicative of net realizable value or reflective of future fair values. Furthermore, although the Corporation 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 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 Corporation’s pension plan assets at fair value for the years ended December 31, 2022 and 2021:

Basis of Fair Value Measurements	Dec 31, 2022				Dec 31, 2021			
In millions	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
Cash and cash equivalents	$ 224	$ 172	$ 52	$ —	$ 289	$ 251	$ 38	$ —
Equity securities:								
U.S. equity securities	$ 288	$ 288	$ —	$ —	$ 431	$ 431	$ —	$ —
Non - U.S. equity securities	255	244	11	—	405	378	26	1
Total equity securities	$ 543	$ 532	$ 11	$ —	$ 836	$ 809	$ 26	$ 1
Fixed income securities:								
Debt - government-issued	$ 665	$ 1	$ 664	$ —	$ 806	$ 4	$ 802	$ —
Debt - corporate-issued	442	1	441	—	796	146	650	—
Debt - asset-backed	20	—	20	—	17	—	17	—
Total fixed income securities	$ 1,127	$ 2	$ 1,125	$ —	$ 1,619	$ 150	$ 1,469	$ —
Alternative investments:								
Private markets	$ 2	$ —	$ —	$ 2	$ 2	$ —	$ —	$ 2
Derivatives - asset position	5	—	5	—	30	—	30	—
Derivatives - liability position	(16)	—	(16)	—	(12)	—	(12)	—
Total alternative investments	$ (9)	$ —	$ (11)	$ 2	$ 20	$ —	$ 18	$ 2
Other investments	$ 3	$ 2	$ 1	$ —	$ 1	$ 1	$ —	$ —
Subtotal	$ 1,888	$ 708	$ 1,178	$ 2	$ 2,765	$ 1,211	$ 1,551	$ 3
Investments measured at net asset value:								
Hedge funds	$ 142				$ 197			
Private markets	411				414			
Real estate	240				237			
Total investments measured at net asset value	$ 793				$ 848			
Items to reconcile to fair value of plan assets:								
Pension trust receivables [1]	$ 4				$ 33			
Pension trust payables [2]	(6)				(35)			
Total	$ 2,679				$ 3,611			

1. Primarily receivables for investment securities sold.
2. Primarily payables for investment securities purchased.

The following table summarizes the changes in fair value of Level 3 pension plan assets for the years ended December 31, 2022 and 2021:

Fair Value Measurement of Level 3 Pension Plan Assets In millions	Equity Securities	Alternative Investments	Total
Balance at Jan 1, 2021	$ 1	$ 6	$ 7
Actual return on plan assets:			
Relating to assets held at Dec 31, 2021	—	(4)	(4)
Balance at Dec 31, 2021	$ 1	$ 2	$ 3
Actual return on plan assets:			
Relating to assets held at Dec 31, 2022	(1)	(2)	(3)
Purchases, sales and settlements	—	2	2
Balance at Dec 31, 2022	$ —	$ 2	$ 2

Defined Contribution Plans
In addition to the qualified defined benefit pension plan, U.S. employees may participate in defined contribution plans by contributing a portion of their compensation, which is partially matched by the Corporation. Expense recognized for all defined contribution plans was $12 million in 2022, $8 million in 2021 and $7 million in 2020.

On March 4, 2021, TDCC 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 were harmonized across the U.S. eligible employee population of TDCC and its consolidated subsidiaries, including the plans of the Corporation. The new matching contribution allows 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 17 - FAIR VALUE MEASUREMENTS
The Corporation's financial instruments are classified as Level 2 measurements. 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.

Assets that are measured using significant other observable inputs are primarily valued by reference to quoted prices of similar assets in active markets, adjusted for any terms specific to that asset. For all other 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. There were no transfers between Levels 1 and 2 in the years ended December 31, 2022 and 2021.

The following table summarizes the fair value of the Corporation's financial instruments at December 31, 2022 and 2021:

Fair Value of Financial Instruments	*2022*				*2021*			
In millions	*Cost*	*Gain*	*Loss*	*Fair Value*	*Cost*	*Gain*	*Loss*	*Fair Value*
Cash equivalents [1]	$ 10	$ —	$ —	$ 10	$ 10	$ —	$ —	$ 10
Long-term debt including debt due within one year	$ (394)	$ —	$ (29)	$ (423)	$ (395)	$ —	$ (133)	$ (528)

1. Money market fund is included in "Cash and cash equivalents" in the consolidated balance sheets and held at amortized cost, which approximates fair value.

Cost approximates fair value for all other financial instruments.

NOTE 18 - RELATED PARTY TRANSACTIONS
Product and Services Agreements
The Corporation sells its products to TDCC to simplify the customer interface process. Products are sold to and purchased from TDCC at prices determined in accordance with the terms of an agreement between UCC and TDCC. After each quarter, the Corporation and TDCC analyze the pricing used for the sales in that quarter and reach agreement on any necessary adjustments, at which point the prices are final. The Corporation also procures certain commodities and raw materials through a TDCC subsidiary and pays a commission to that TDCC subsidiary based on the volume and type of commodities and raw materials purchased.

The Corporation also has a master services agreement with TDCC, whereby TDCC provides services including, but not limited to: accounting; legal; treasury (investments, cash management, risk management, insurance); procurement; human resources; environmental; health and safety; and business management for UCC. Under the master services agreement with TDCC, general administrative and overhead type services that TDCC routinely allocates to various businesses are charged to UCC. The master services agreement cost allocation basis is headcount and includes a 10 percent service fee.

The following table summarizes UCC's transactions with TDCC and a TDCC subsidiary related to product and services agreements for the years ended December 31, 2022, 2021 and 2020:

Product and Services Agreements Transactions In millions	*2022*	*2021*	*2020*	*Income Statement Classification*
TDCC Subsidiary:				
Commodity and raw materials purchases [1]	$ 1,909	$ 1,915	$ 1,021	Cost of sales
Commission expense	$ 19	$ 21	$ 22	Sundry income (expense) - net
TDCC:				
General administrative and overhead type services and service fee [2]	$ 65	$ 63	$ 31	Sundry income (expense) - net
Activity-based costs	$ 89	$ 74	$ 87	Cost of sales

1. Period-end balances on hand are included in inventory. The increase in purchase costs from 2020 was primarily due to higher feedstock and energy costs.
2. The increase in services and fees from 2020 resulted from TDCC's periodic review of the actual cost of services provided to UCC in accordance with related agreements.

Management believes the method used for determining expenses charged by TDCC is reasonable. TDCC provides these services by leveraging its centralized functional service centers to provide services at a cost that management believes provides an advantage to the Corporation.

The monitoring and execution of risk management policies related to interest rate and foreign currency risks, which are based on TDCC's risk management philosophy, are provided as a service to UCC.

The Corporation incurred asset losses and other costs and experienced lost sales and margins due to severe weather events that impacted the U.S. Gulf Coast in 2021. These costs and losses are covered, in part, by an insurance program purchased by TDCC from its insurance affiliate. In December 2021, the Corporation recorded an insurance recovery of $114 million from TDCC for the Corporation's share of covered losses and incurred costs, included in "Cost of sales" in the consolidated statements of income and included in "Accounts receivable - Related companies" in the consolidated balance sheets at December 31, 2021. Proceeds from this insurance recovery were received in 2022.

Tax Sharing Agreement

In accordance with the Tax Sharing Agreement between the Corporation and TDCC, the Corporation makes payments to TDCC to cover the Corporation's estimated federal tax liability; payments were $155 million in 2022, $42 million in 2021 and $100 million in 2020.

Cash Management

As part of TDCC's cash management process, UCC is a party to revolving loans with TDCC that mature December 30, 2023 and have interest rates based on alternative reference rates, effective January 1, 2022, and based on LIBOR (London Interbank Offered Rate) in prior periods. At December 31, 2022, the Corporation had a note receivable of $958 million ($988 million at December 31, 2021) from TDCC under a revolving loan agreement. The Corporation may draw from this note receivable in support of its daily working capital requirements and, as such, the net effect of cash inflows and outflows under this revolving loan agreement is presented in the consolidated statements of cash flows as an operating activity.

The Corporation also has a separate revolving credit agreement with TDCC that allows the Corporation to borrow or obtain credit enhancements up to an aggregate of $1 billion. TDCC may demand repayment with a 30-day written notice to the Corporation, subject to certain restrictions. A related collateral agreement provides for the replacement of certain existing pledged assets, primarily equity interests in various subsidiaries and joint ventures, with cash collateral. At December 31, 2022, $942 million was available under the revolving credit agreement ($935 million at December 31, 2021). The cash collateral was reported as "Noncurrent receivables from related companies" in the consolidated balance sheets.

Dividends and Other Equity Transactions

On a quarterly basis, the Corporation's Board reviews and determines if there will be a dividend distribution to its parent company and sole shareholder, TDCC. The Board takes into consideration the level of earnings and cash flows, among other factors, in determining the amount of the dividend distribution.

The following table summarizes cash dividends declared and paid to TDCC for the years ended 2022, 2021 and 2020:

Cash Dividends Declared and Paid In millions	*2022*	*2021*	*2020*
Cash dividends declared and paid	$ 1,063	$ 288	$ 362

NOTE 19 - BUSINESS AND GEOGRAPHIC REGIONS

TDCC conducts its worldwide operations through principal product groups, and the Corporation's business activities comprise components of TDCC's principal product groups rather than stand-alone operations. The Corporation sells substantially all of its products to TDCC in order to simplify the customer interface process, at prices determined in accordance with the terms of an agreement between UCC and TDCC. Because there are no separate reportable business segments for the Corporation and no detailed business information is provided to a chief operating decision maker regarding the Corporation's stand-alone operations, the Corporation's results are reported as a single operating segment.

Sales are attributed to geographic regions based on customer location; long-lived assets are attributed to geographic regions based on asset location. Sales to external customers and long-lived assets by geographic region were as follows:

Geographic Region Information In millions	*United States*	*Asia Pacific*	*Rest of World*	*Total*
2022				
Sales to external customers [1]	$ 182	$ 3	$ 6	$ 191
Long-lived assets	$ 1,149	$ 22	$ 11	$ 1,182
2021				
Sales to external customers [1]	$ 139	$ 4	$ 11	$ 154
Long-lived assets	$ 1,169	$ 24	$ 15	$ 1,208
2020				
Sales to external customers [1]	$ 95	$ 23	$ 11	$ 129
Long-lived assets	$ 1,226	$ 20	$ 19	$ 1,265

1. Of total sales to external customers, sales in Malaysia were approximately 1 percent in 2022, 2 percent in 2021 and 18 percent in 2020, and are included in Asia Pacific.

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

None.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures
As of the end of the period covered by the Annual Report on Form 10-K, the Corporation carried out an evaluation, under the supervision and with the participation of the Corporation's Disclosure Committee and the Corporation's management, including the Chief Executive Officer and the Chief Financial Officer, of the effectiveness of the design and operation of the Corporation's disclosure controls and procedures pursuant to Exchange Act Rule 15d - 15(b). Based upon that evaluation, the Chief Executive Officer and the Chief Financial Officer concluded that the Corporation's disclosure controls and procedures were effective.

Changes in Internal Control Over Financial Reporting
There were no changes in the Corporation's internal control over financial reporting identified in connection with the evaluation required by paragraph (d) of Exchange Act Rules 13a-15 or 15d-15 that was conducted during the quarter ended December 31, 2022, that materially affected or were reasonably likely to materially affect the Corporation's 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 Corporation's 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 Corporation's consolidated financial statements in accordance with accounting principles generally accepted in the United States of America.

The Corporation's 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 Corporation;
- 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 Corporation are being made only in accordance with authorizations of management and Directors of the Corporation; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Corporation's 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 Corporation's internal control over financial reporting and concluded that, as of December 31, 2022, such internal control is effective. In making the assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in *Internal Control--Integrated Framework (2013).*

The Corporation's internal control over financial reporting was not subject to attestation by the Corporation's independent registered public accounting firm, Deloitte & Touche LLP, pursuant to the rules of the Securities and Exchange Commission that permit the Corporation to provide only management's report. Therefore, this annual report does not include an attestation report regarding internal controls over financial reporting from Deloitte & Touche LLP.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Omitted pursuant to General Instruction I of Form 10-K.

ITEM 11. EXECUTIVE COMPENSATION

Omitted pursuant to General Instruction I of Form 10-K.

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

Omitted pursuant to General Instruction I of Form 10-K.

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

Omitted pursuant to General Instruction I of Form 10-K.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The Dow Inc. Audit Committee pre-approved all auditing services and permitted non-audit services for 2022 (including the fees and terms thereof) to be performed for Dow Inc. and its subsidiaries (including the Corporation) by its independent auditor, subject to the *de minimus* exception for non-audit services described in Section 10A(i)(1)(B) of the Securities Exchange Act, any such exceptions are approved by the Dow Inc. Audit Committee prior to the completion of the audit. The Corporation's management and its Board of Directors subscribe to these policies and procedures. For the years ended December 31, 2022 and 2021, professional services were performed for the Corporation by Deloitte & Touche LLP, the member firms of Deloitte Touche Tohmatsu Limited, and their respective affiliates (collectively, the "Deloitte Entities").

Total fees paid to the Deloitte Entities were $1.5 million in 2022 and 2021. These are the aggregate of fees billed for the audit of the Corporation's annual financial statements, the reviews of the financial statements in the Quarterly Reports on Form 10-Q, statutory audits and other regulatory filings.

Union Carbide Corporation and Subsidiaries

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

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

1. The Corporation's 2022 Consolidated Financial Statements and the Report of Independent Registered Public Accounting Firm (PCAOB ID: 34) are included in Item 8 of this Annual Report on Form 10-K.

2. Financial Statement Schedules are omitted because of the absence of the conditions under which they are required or because the information called for is included in the Consolidated Financial Statements or Notes thereto.

   The following exhibits are filed with or incorporated by reference into this Annual Report on Form 10-K:

Exhibit No.	*Description of Exhibit*
2.1	Agreement and Plan of Merger dated as of August 3, 1999 among Union Carbide Corporation, The Dow Chemical Company and Transition Sub Inc., incorporated by reference to Exhibit 2 of the Corporation's Current Report on Form 8-K dated August 3, 1999.
2.2	Agreement for the Sale & Purchase of Shares, dated as of August 17, 2009, among Union Carbide Corporation, UCMG L.L.C. and Petroliam Nasional Berhad, incorporated by reference to Exhibit 2.1 of the Corporation's Current Report on Form 8-K dated September 30, 2009.
3.1	Restated Certificate of Incorporation of Union Carbide Corporation under Section 807 of the Business Corporation Law, as filed on May 13, 2008, incorporated by reference to Exhibit 3.1.4 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended June 30, 2008.
3.2	Amended and Restated Bylaws of Union Carbide Corporation, amended as of April 22, 2004, incorporated by reference to Exhibit 3.2 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended March 31, 2004.
4.1	Indenture dated June 1, 1995, between the Corporation and the Chase Manhattan Bank (formerly Chemical Bank), as trustee, incorporated by reference to Exhibit 4.1.2 to the Corporation's Registration Statement on Form S-3, File No. 33-660705, filed with the SEC on October 13, 1995.
4.2	The Corporation will furnish to the Commission upon request any other debt instrument referred to in Item 601(b)(4)(iii)(A) of Regulation S-K.
10.1	Amended and Restated Service Agreement, effective as of July 1, 2002, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.23 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2002.
10.1.1	Service Addendum No. 2 to the Service Agreement, effective as of August 1, 2001, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.23.2 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2002.
10.1.2	Restated Service Addendum No. 1 to the Service Agreement, effective as of February 6, 2001, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.23.3 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2002.
10.1.3	Service Addendum No. 3 to the Amended and Restated Service Agreement, effective as of January 1, 2005, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.1.3 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2004.
10.1.4	First Amendment to Amended and Restated Service Agreement, effective as of January 1, 2011, between the Corporation and The Dow Chemical Company incorporated by reference to Exhibit 10.1.4 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended March 31, 2011.

Exhibit No.	Description of Exhibit
10.1.5	Service Addendum No. 4 to the Amended and Restated Service Agreement, effective as of January 1, 2019, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.1.5 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2021.
10.2	Second Amended and Restated Sales Promotion Agreement, effective January 1, 2004, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.24 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2003.
10.2.1	First Amendment to Second Amended and Restated Sales Promotion Agreement, effective as of March 22, 2013, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.2.1 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended March 31, 2013.
10.2.2	Second Amendment to Second Amended and Restated Sales Promotion Agreement, effective as of July 1, 2014, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.2.2 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2014.
10.3	Third Amended and Restated Agreement (to Provide Materials and Services), dated as of March 1, 2008, between the Corporation and Dow Hydrocarbons and Resources LLC, incorporated by reference to Exhibit 10.3 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008.
10.4	Amended and Restated Tax Sharing Agreement, effective as of February 7, 2001, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.27 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended June 30, 2003.
10.5	Amended and Restated Revolving Credit Agreement dated as of May 28, 2004, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.28 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended June 30, 2004.
10.5.1	First Amendment dated October 29, 2004 to the Amended and Restated Revolving Credit Agreement, dated as of May 28, 2004, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.1 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2004.
10.5.2	Second Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 30, 2004, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.2 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2004.
10.5.3	Third Amendment to the Amended and Restated Revolving Credit Agreement, dated as of September 30, 2005, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.3 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2005.
10.5.4	Fourth Amendment to the Amended and Restated Revolving Credit Agreement, dated as of September 30, 2006, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.4 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2006.
10.5.5	Fifth Amendment to the Amended and Restated Revolving Credit Agreement, dated as of September 30, 2007, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors incorporated by reference to Exhibit 10.5.5 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2007.
10.5.6	Sixth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of September 30, 2008, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.6 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2008.
10.5.7	Seventh Amendment to the Amended and Restated Revolving Credit Agreement, effective as of September 30, 2009, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.7 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2009.
10.5.8	Eighth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of September 30, 2010, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.8 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2010.

Exhibit No.	Description of Exhibit
10.5.9	Ninth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of September 30, 2011, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.9 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2011.
10.5.10	Tenth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 6, 2012, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.10 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2012.
10.5.11	Eleventh Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 16, 2013, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.11 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2013.
10.5.12	Twelfth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 17, 2014, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.12 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2014.
10.5.13	Thirteenth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 16, 2015, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.13 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2015.
10.5.14	Fourteenth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 12, 2016, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.14 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2016.
10.5.15	Fifteenth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 30, 2017, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.15 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2017.
10.5.16	Sixteenth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 30, 2018, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.16 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2018.
10.5.17	Seventeenth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 30, 2019, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.17 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2019.
10.5.18	Eighteenth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 30, 2020, among the Corporation, The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.18 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2020.
10.5.19	Nineteenth Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 30, 2021, between the Corporation and The Dow Chemical Company and certain Subsidiary Guarantors, incorporated by reference to Exhibit 10.5.19 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2021.
10.5.20	Twentieth Amendment to the Amended and Restated Revolving Credit Agreement, dated March 31, 2022, effective as of January 1, 2022, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.5.20 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended March 31, 2022.
10.5.21*	Twenty-First Amendment to the Amended and Restated Revolving Credit Agreement, effective as of December 30, 2022, between the Corporation and The Dow Chemical Company.
10.6	Amended and Restated Pledge and Security Agreement dated as of May 28, 2004, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.29 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended June 30, 2004.
10.7	Second Amended and Restated Revolving Loan Agreement, effective as of November 1, 2005, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2005.

Exhibit No.	*Description of Exhibit*
10.7.1	First Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of December 31, 2007, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.1 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2007.
10.7.2	Second Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of August 1, 2009, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.2 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2009.
10.7.3	Third Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of February 1, 2010, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.3 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2010.
10.7.4	Fourth Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of August 1, 2010, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.4 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2010.
10.7.5	Fifth Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of August 1, 2011, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.5 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2011.
10.7.6	Sixth Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of April 1, 2012, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.6 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2012.
10.7.7	Seventh Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of August 1, 2013, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.7 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2013.
10.7.8	Eighth Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of April 26, 2017, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.8 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2018.
10.7.9	Ninth Amendment to Second Amended and Restated Revolving Loan Agreement, dated March 31, 2022, effective as of January 1, 2022, between the Corporation and The Dow Chemical Company, incorporated by reference to Exhibit 10.7.9 of the Corporation's Quarterly Report on Form 10-Q for the quarter ended March 31, 2022.
10.7.10*	Tenth Amendment to Second Amended and Restated Revolving Loan Agreement, effective as of December 30, 2022, between the Corporation and The Dow Chemical Company.
10.9	Contribution Agreement dated as of December 21, 2007, among the Corporation, Dow International Holdings Company and The Dow Chemical Company, incorporated by reference to Exhibit 10.9 of the Corporation's Annual Report on Form 10-K for the year ended December 31, 2007.
21	Omitted pursuant to General Instruction I of Form 10-K.
23*	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.

Exhibit No.	*Description of Exhibit*
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

The Corporation 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 Corporation's principal executive offices.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

Union Carbide Corporation and Subsidiaries

Trademark Listing

The following trademarks of The Dow Chemical Company or an affiliated company of Dow appear in this report:
CARBOWAX, FLEXOMER, LP OXO, METEOR, REDI-LINK, SENTRY, SI-LINK, TERGITOL, TRITON, TUFLIN, UCAR, UCARTHERM, UCON, UNIGARD, UNIPURGE, UNIVAL

The following registered service mark of The American Chemistry Council in the United States appears in this report: Responsible Care®

® ™ Trademark of The Dow Chemical Company ("TDCC") or an affiliated company, except as otherwise specified.

Union Carbide Corporation 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 1, 2023.

UNION CARBIDE CORPORATION

/s/ RONALD C. EDMONDS

Ronald C. Edmonds, Controller and Vice President of Controllers and Tax
The Dow Chemical Company
(Authorized Representative of Union Carbide Corporation)

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed below on February 1, 2023, by the following persons on behalf of the registrant and in the capacities indicated:

/s/ RONALD C. EDMONDS

Ronald C. Edmonds, Controller and Vice President of Controllers and Tax
The Dow Chemical Company
(Authorized Representative of Union Carbide Corporation)

/s/ IGNACIO MOLINA

Ignacio Molina, Director, Vice President, Treasurer and Chief Financial Officer (Principal Financial Officer)

/s/ MARSHALL A. HEINBERG

Marshall A. Heinberg, Director

/s/ FERNANDO SIGNORINI

Fernando Signorini, Director, President and Chief Executive Officer (Principal Executive Officer)

Supplemental Information to be Furnished With Reports Filed Pursuant to Section 15(d) of the Act by Registrants Which Have Not Registered Securities Pursuant to Section 12 of the Act

The Corporation is a wholly owned subsidiary of The Dow Chemical Company ("TDCC"). TDCC is a wholly owned subsidiary of Dow Inc. As such, the Corporation does not send an annual report to security holders or proxy material with respect to any annual or other meeting of security holders to TDCC, Dow Inc. or any other security holders.

TWENTY-FIRST AMENDMENT TO THE AMENDED AND RESTATED REVOLVING CREDIT AGREEMENT

This Twenty-First Amendment to the Amended and Restated Revolving Credit Agreement (this "Amendment") is made effective as of December 30, 2022, and is entered into among Union Carbide Corporation, as Borrower ("Borrower") and The Dow Chemical Company, as Lender ("Lender") (together, the "Parties").

BACKGROUND

The Parties have entered into the Amended and Restated Revolving Credit Agreement dated as of May 28, 2004, as amended (the "Credit Agreement").

The Parties desire to amend the Credit Agreement according to the terms in this Amendment. Any capitalized terms used in this Amendment, but not otherwise defined in this Amendment, are as defined in the Credit Agreement.

THE AGREEMENT

1. Amendment to Section 1.1. The Parties agree to amend Section 1.1 of the Credit Agreement by Replacing the definition of "Scheduled Termination Date" with the following definition:

   "Scheduled Termination Date" means December 30, 2023.

2. No Other Amendment or Waiver. Except as expressly amended by this Amendment, the Credit Agreement and all other Loan Documents remain in full force and effect in accordance with their terms, and the Parties ratify and confirm the Credit Agreement and all other Loan Documents in all respects.

3. Execution in Counterparts. This amendment may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so executed will be deemed to be an original and all of which taken together will constitute one and the same agreement. Signature pages may be detached from multiple separate counterparts and attached to a single counterpart so that all signature pages are attached to the same document.

4. Governing Law. This Amendment and the rights and obligations of the Parties to this Amendment will be governed by, and construed and interpreted in accordance with, the law of the State of New York.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties have caused this Amendment to be duly executed by their authorized representatives.

LENDER:

THE DOW CHEMICAL COMPANY

By: /s/ MICHAEL NASH
Michael Nash
Global Treasury Director, Financial Planning, Operations and Systems

BORROWER:

UNION CARBIDE CORPORATION

By: /s/ IGNACIO MOLINA
Ignacio Molina

Chief Financial Officer, Vice President and Treasurer

Signature Page
Twenty-First Amendment to the Amended and Restated Revolving Credit Agreement

TENTH AMENDMENT TO SECOND AMENDED AND RESTATED REVOLVING LOAN AGREEMENT

This Tenth Amendment to the Second Amended and Restated Revolving Loan Agreement (the "Amendment"), effective as of December 30, 2022, is entered into by and between Union Carbide Corporation, a New York corporation (the "Lender") and The Dow Chemical Company, a Delaware corporation (the "Borrower").

WHEREAS, the Lender and the Borrower are parties to the Second Amended and Restated Revolving Loan Agreement dated as of November 1, 2005, as amended (the "Loan Agreement");

WHEREAS, the Lender and the Borrower wish to extend the Maturity Date, as defined in the Loan Agreement and as contemplated herein:

NOW, THEREFORE, in view of the following terms and conditions and for other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Section 1.12 definition of "Maturity Date" in the Loan Agreement is deleted in its entirety and replaced with the following Section 1.12 definition of "Maturity Date":

   "Maturity Date" means December 30, 2023.

2. No Other Amendment or Waiver. Except as expressly amended by this Amendment, the Loan Agreement remains in full force and effect in accordance with its terms.

3. Execution in Counterparts. This Amendment may be executed in any number of counterparts, each of which when so executed will be deemed to be an original and all of which taken together will constitute one and the same agreement. Signature pages may be detached from multiple separate counterparts and attached to a single counterpart so that all signature pages are attached to the same document.

4. Governing Law. This Amendment and the rights and obligations of the parties to this Amendment will be governed by and construed and interpreted in accordance with the laws of the State of New York.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties have caused this Amendment to be duly executed by their authorized representatives.

LENDER:

THE DOW CHEMICAL COMPANY

By: /s/ MICHAEL NASH
Michael Nash
Global Treasury Director, Financial Planning, Operations and Systems

BORROWER:

UNION CARBIDE CORPORATION

By: /s/ IGNACIO MOLINA
Ignacio Molina
Chief Financial Officer, Vice President and Treasurer

Signature Page
Tenth Amendment to the Second Amended and Restated Revolving Credit Agreement

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Union Carbide Corporation:

Ankura Consulting Group, LLC ("Ankura"), hereby consents to the use of Ankura's name and the reference to Ankura's reports appearing in this Annual Report on Form 10-K of Union Carbide Corporation for the year ended December 31, 2022.

/s/ AMY BROCKMAN

Amy Brockman
Senior Managing Director
Ankura Consulting Group, LLC
February 1, 2023

Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

I, Fernando Signorini, certify that:

1. I have reviewed this annual report on Form 10-K of Union Carbide Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's 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 registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ FERNANDO SIGNORINI
Fernando Signorini
President and Chief Executive Officer
February 1, 2023

Certification Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

I, Ignacio Molina, certify that:

1. I have reviewed this annual report on Form 10-K of Union Carbide Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's 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 registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ IGNACIO MOLINA

Ignacio Molina
Vice President, Treasurer and Chief Financial Officer
February 1, 2023

Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

I, Fernando Signorini, President and Chief Executive Officer of Union Carbide Corporation (the “Corporation”), certify that:

1. The Annual Report on Form 10-K of the Corporation for the year ended December 31, 2022 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 Corporation.

/s/ FERNANDO SIGNORINI

Fernando Signorini
President and Chief Executive Officer
February 1, 2023

Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

I, Ignacio Molina, Vice President, Treasurer and Chief Financial Officer of Union Carbide Corporation (the “Corporation”), certify that:

1. The Annual Report on Form 10-K of the Corporation for the year ended December 31, 2022 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 Corporation.

/s/ IGNACIO MOLINA

Ignacio Molina
Vice President, Treasurer and Chief Financial Officer
February 1, 2023