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

(Mark One)

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

For the fiscal year ended December 31, 2023
or

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

For the transition period from ____ to ____
Commission File No. 001-34400
TRANE TECHNOLOGIES PLC
(Exact name of registrant as specified in its charter)

Ireland		**98-0626632**
(State or other jurisdiction of incorporation or organization)		*(I.R.S. Employer Identification No.)*

170/175 Lakeview Dr.
Airside Business Park
Swords Co. Dublin
Ireland
(Address of principal executive offices)
Registrant's telephone number, including area code: +(353) (0) 18707400

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Ordinary Shares, Par Value $1.00 per Share	TT	New York Stock Exchange
5.250% Senior Notes due 2033	TT33	New York Stock Exchange

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

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

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

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

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

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

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

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

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

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to § 240.10D-1(b). ☐

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

The aggregate market value of ordinary shares held by nonaffiliates on June 30, 2023 was $43.6 billion based on the closing price of such stock on the New York Stock Exchange.

The number of ordinary shares outstanding of Trane Technologies plc as of February 2, 2024 was 227,072,224.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant’s proxy statement to be filed within 120 days of the close of the registrant’s fiscal year in connection with the registrant’s Annual General Meeting of Shareholders to be held June 6, 2024 are incorporated by reference into Part II and Part III of this Form 10-K.

TRANE TECHNOLOGIES PLC

Form 10-K
For the Fiscal Year Ended December 31, 2023

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CAUTIONARY STATEMENT FOR FORWARD LOOKING STATEMENTS

Certain statements in this report, other than purely historical information, are "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. These forward-looking statements generally are identified by the words "believe," "project," "expect," "anticipate," "estimate," "forecast," "outlook," "intend," "strategy," "plan," "potential," "predict," "target," "may," "might," "could," "should," "will," "would," "will be," "will continue," "will likely result," or the negative thereof or variations thereon or similar terminology generally intended to identify forward-looking statements.

Forward-looking statements may relate to such matters as projections of revenue, margins, expenses, tax provisions, earnings, cash flows, benefit obligations, share or debt repurchases or other financial items; any statements of the plans, strategies and objectives of management for future operations, including those relating to any statements concerning expected development, performance or market share relating to our products and services; any statements regarding future economic conditions or our performance including our future performance statements related to the continued impact of the Coronavirus Disease 2019 (COVID-19) global pandemic; any statements regarding our sustainability commitments; any statements regarding pending investigations, claims or disputes; any statements of expectation or belief; and any statements of assumptions underlying any of the foregoing. These statements are based on currently available information and our current assumptions, expectations and projections about future events. While we believe that our assumptions, expectations and projections are reasonable in view of the currently available information, you are cautioned not to place undue reliance on our forward-looking statements. You are advised to review any further disclosures we make on related subjects in materials we file with or furnish to the Securities and Exchange Commission. Forward-looking statements speak only as of the date they are made and are not guarantees of future performance. They are subject to future events, risks and uncertainties - many of which are beyond our control - as well as potentially inaccurate assumptions, that could cause actual results to differ materially from our expectations and projections. We do not undertake to update any forward-looking statements.

Factors that might affect our forward-looking statements include, among other things:

- overall economic, political and business conditions in the markets in which we operate including recessions, economic downturns, price instability, slow economic growth and social and political instability;
- impacts of global health crises, including the COVID-19 pandemic, and other epidemics, pandemics, or other contagious outbreaks on our business operations, financial results and financial position and on the world economy;
- commodity and raw material shortages, supply chain risks and price increases;
- national and international conflict, including war, civil disturbances and terrorist acts, including the Russia-Ukraine conflict and other geopolitical hostilities;
- trade protection measures such as import or export restrictions and requirements, the imposition of tariffs and quotas or revocation or material modification of trade agreements;
- competitive factors in the markets in which we compete;
- the development, commercialization and acceptance of new and enhanced products and services;
- attracting and retaining talent;
- work stoppages, union negotiations, labor disputes and similar issues;
- other capital market conditions, including availability of funding sources, interest rate fluctuations and other changes in borrowing costs;
- currency exchange rate fluctuations, exchange controls and currency devaluations;
- the outcome of any litigation, governmental investigations, claims or proceedings;
- risks and uncertainties associated with the asbestos-related bankruptcy for our deconsolidated subsidiaries Aldrich Pump LLC and Murray Boiler LLC;
- the impact of potential information technology system failures, vulnerabilities, data security breaches or other cybersecurity issues;
- evolving data privacy and protection laws;
- intellectual property infringement claims and the inability to protect our intellectual property rights;
- changes in laws and regulations;

- climate change, changes in weather patterns, natural disasters and seasonal fluctuations;

- national, regional and international regulations and policies associated with climate change and the environment;
- the outcome of any tax audits or settlements;
- the strategic acquisition or divestiture of businesses, product lines and joint ventures;
- impairment of our goodwill, indefinite-lived intangible assets and/or our long-lived assets; and
- changes in tax laws and requirements (including tax rate changes, new tax laws, new and/or revised tax law interpretations and any legislation that may limit or eliminate potential tax benefits resulting from our incorporation in a non-U.S. jurisdiction, such as Ireland).

Some of the significant risks and uncertainties that could cause actual results to differ materially from our expectations and projections are described more fully in Part I, Item 1A “Risk Factors.” You should read that information in conjunction with “Management's Discussion and Analysis of Financial Condition and Results of Operations” in Part II, Item 7 of this report and our Consolidated Financial Statements and related notes in Part II, Item 8 “Financial Statements" of this report. We note such information for investors as permitted by the Private Securities Litigation Reform Act of 1995.

PART I

Item 1. BUSINESS

Overview

Trane Technologies plc, a public limited company, incorporated in Ireland in 2009, and its consolidated subsidiaries (collectively we, us, our, the Company) is a global climate innovator. We bring sustainable and efficient solutions to buildings, homes and transportation through our strategic brands, Trane® and Thermo King®, and our environmentally responsible portfolio of products, services and connected intelligent controls. We generate revenue and cash primarily through the design, manufacture, sales and service of solutions for Heating, Ventilation and Air Conditioning (HVAC), transport refrigeration, and custom refrigeration solutions. As an industry leader with an extensive global install base, our growth strategy includes expanding recurring revenue through services and rental options. Our unique business operating system, uplifting culture and highly engaged team around the world are also central to our earnings and cash flow growth.

Through our sustainability-focused strategy and purpose to *boldly challenge what's possible for a sustainable world*, we meet critical needs and growing global demand for innovation that reduces greenhouse gas emissions while enabling healthier, efficient indoor environments and safe, reliable delivery of essential temperature-controlled cargo. We have announced certain defined sustainability commitments with a goal of achieving these commitments by 2030 (2030 Sustainability Commitments). Trane Technologies' bold 2030 Sustainability Commitments have been verified by the Science Based Targets initiative (SBTi) and include our 'Gigaton Challenge' to reduce customer greenhouse gas emissions by a billion metric tons, 'Leading by Example' through carbon-neutral operations across our own footprint, and 'Opportunity for All' by building a diverse workforce reflective of our communities.

Reportable Segments

We operate under three reportable segments.

- Our Americas segment innovates for customers in North America and Latin America. The Americas segment encompasses commercial heating, cooling and ventilation systems, building controls and solutions, and energy services and solutions; residential heating and cooling; and transport refrigeration systems and solutions. This segment had 2023 net revenues of $13,832.0 million.
- Our EMEA segment innovates for customers in the Europe, Middle East and Africa region. The EMEA segment encompasses heating, cooling and ventilation systems, services and solutions for commercial buildings and transport refrigeration systems and solutions. This segment had 2023 net revenues of $2,401.2 million.
- Our Asia Pacific segment innovates for customers throughout the Asia Pacific region. The Asia Pacific segment encompasses heating, cooling and ventilation systems, services and solutions for commercial buildings and transport refrigeration systems and solutions. This segment had 2023 net revenues of $1,444.4 million.

Products and Services

Our principal products and services include the following:

Air conditioners	Multi-pipe HVAC systems
Air exchangers	Package heating and cooling systems
Air handlers	Packaged rooftop units
Airside and terminal devices	Parts and supplies (aftermarket and OEM)
Air-sourced heat pumps	Rail refrigeration systems
Asset management systems	Rate chambers
Auxiliary power units (electric and diesel)	Refrigerant reclamation
Building management systems	Renewable energy projects
Bus air purification systems	Repair and maintenance services
Bus and rail HVAC systems	Rental services
Chillers	Residential air filters
Coils and condensers	Residential air filtration system
Container refrigeration systems and gensets	Residential hybrid heating solutions
Control systems	Self-powered truck refrigeration systems
Cryogenic refrigeration systems	Service agreements
Decarbonization programs	Telematics solutions
Dehumidifiers	Temporary heating and cooling systems
Ductless systems	Thermal energy storage
Energy efficiency programs	Thermostats/controls & associated digital solutions
Energy infrastructure programs	Trailer refrigeration systems (diesel, electric and hybrid)
Energy management services	Transport heater products
Furnaces	Truck refrigeration systems (diesel, electric and hybrid)
Geothermal systems	Ultra-low temperature freezers
Home automation	Unitary systems (light and large)
Humidifiers	Variable refrigerant flow systems
HVAC Performance-monitoring applications	Vehicle-powered truck refrigeration systems
Indoor air quality assessments and related products for HVAC and Transport solutions	Ventilation
Industrial refrigeration	Water source heat pumps
Installation contracting	

These products are sold primarily under our tradenames including Trane® and Thermo King®.

Competitive Conditions

Our products and services are sold in highly competitive markets throughout the world. Due to the diversity of these products and services and the variety of markets served, we encounter a wide variety of competitors that vary by product line and services. They include well-established regional or specialized competitors, as well as larger U.S. and non-U.S. corporations or divisions of larger companies.

The principal methods of competition in these markets relate to price, quality, delivery, service and support, technology and innovation. We are one of the leading manufacturers in the world of HVAC systems and services and transport temperature control products and services.

Distribution

Our products are distributed by a number of methods, which we believe are appropriate to the type of product. U.S. sales are made through branch sales offices, distributors and dealers across the country. Non-U.S. sales are made through numerous subsidiary sales and service companies with a supporting chain of distributors throughout the world.

Operations by Geographic Area

Approximately 28% of our net revenues in 2023 were derived outside the U.S. and we sold products in approximately 100 countries. Therefore, the attendant risks of manufacturing or selling in a particular country, such as currency devaluation, nationalization and establishment of common markets, may have an adverse impact on our non-U.S. operations.

Customers

We have no customer that accounted for more than 10% of our consolidated net revenues in 2023, 2022 or 2021. No material part of our business is dependent upon a single customer or a small group of customers; therefore, the loss of any one customer would not have a material adverse effect on our results of operations or cash flows.

Materials

We both manufacture and procure many of the components included in our products. For components we manufacture, we are required to source a wide variety of commodities such as steel, copper, and aluminum. These principal commodities are purchased from a large number of independent sources around the world, primarily within the region where the products are manufactured. We believe that available sources of supply will generally be sufficient for the foreseeable future.

For many components we procure, we have an effective supply chain resiliency plan and multiple capable sources to ensure sufficient supply, however there are certain categories of components that could occasionally see limited availability or shortages in line with industry trends.

Seasonality

Demand for certain products and services is influenced by weather conditions. For instance, sales in our commercial and residential HVAC businesses historically tend to be higher in the second and third quarters of the year because this represents spring and summer in the U.S. and other northern hemisphere markets, which are the peak seasons for sales of air conditioning systems and services. Therefore, results of any quarterly period may not be indicative of expected results for a full year and unusual weather patterns or events could positively or negatively affect certain segments of our business and impact overall results of operations.

Research and Development

We engage in research and development activities in an effort to introduce new products, enhance existing product effectiveness, improve ease of use and reliability as well as expand the various applications for which our products may be appropriate. In 2023, we spent $252.3 million on research and development, focused on product and system sustainability improvements such as increasing energy efficiency, developing products that allow for use of lower global warming potential refrigerants, reducing material content in products, and designing products for circularity. New product development (NPD) programs complete a Design for Sustainability module within our NPD process to ensure that programs have a positive impact on sustainability.

We also have a strong focus on sustaining activities, which include costs incurred to reduce production costs, improve existing products, create custom solutions for customers and provide support to our manufacturing facilities. We anticipate that we will continue to make significant expenditures for research and development and sustaining activities as we look to maintain and improve our competitive position.

Patents and Licenses

Our intellectual property rights are important to our business and include numerous patents, trademarks, copyrights, trade secrets, proprietary technology, technical data, business processes, and other confidential information. Although in the aggregate we consider our intellectual property rights to be valuable to our operations, we do not believe that our business is materially dependent on a single intellectual property right or any group of them. In our opinion, engineering, production skills and experience are more responsible for our market position than our intellectual property rights.

Backlog

Our backlog of orders, believed to be firm, at December 31, was as follows:

In millions		2023		2022
Americas	$	5,302.9	$	5,325.2
EMEA		614.9		616.1
Asia Pacific		1,012.7		941.8
Total	$	6,930.5	$	6,883.1

These backlog figures are based on orders received and only include amounts associated with our equipment and contracting and installation performance obligations. A major portion of our residential products are built in advance of order and either shipped or assembled from stock. We expect to ship a majority of the December 31, 2023 backlog during 2024. However, orders for specialized machinery or specific customer applications are submitted with extended lead times and are subject to revision and deferral, and to a lesser extent cancellation or termination. To the extent projects are delayed or there are resource constraints, the timing of our revenue could be affected.

Environmental Matters

We continue to be dedicated to environmental and sustainability programs to minimize the use of natural resources, reduce the utilization and generation of hazardous materials from our manufacturing processes and to remediate identified environmental concerns. As to the latter, we are currently engaged in site investigations and remediation activities to address environmental cleanup from past operations at current and former manufacturing facilities.

It is our policy to establish environmental reserves for investigation and remediation activities when it is probable that a liability has been incurred and a reasonable estimate of the liability can be made. Estimated liabilities are determined based upon existing remediation laws and technologies. Inherent uncertainties exist in such evaluations due to unknown environmental conditions, changes in government laws and regulations, and changes in cleanup technologies. The environmental reserves are updated on a routine basis as remediation efforts progress and new information becomes available.

We are sometimes a party to environmental lawsuits and claims and have received notices of potential violations of environmental laws and regulations from the Environmental Protection Agency and similar state and international authorities. We have also been identified as a potentially responsible party (PRP) for cleanup costs associated with off-site waste disposal at federal Superfund and state remediation sites. In most instances at multi-party sites, our share of the liability is not material.

In estimating our liability at multi-party sites, we have assumed that we will not bear the entire cost of remediation of any site to the exclusion of other PRPs who may be jointly and severally liable. The ability of other PRPs to participate has been taken into account, based on our understanding of the parties’ financial condition and probable contributions on a per site basis.

For a further discussion of our potential environmental liabilities, see Note 20 "Commitments and Contingencies" to the Consolidated Financial Statements.

Asbestos-Related Matters

We are involved in a number of asbestos-related lawsuits, claims and legal proceedings. In June 2020, our indirect wholly-owned subsidiaries Aldrich Pump LLC (Aldrich) and Murray Boiler LLC (Murray) each filed a voluntary petition for reorganization under Chapter 11 of Title 11 of the United States Code (the Bankruptcy Code) in the United States Bankruptcy Court for the Western District of North Carolina in Charlotte (the Bankruptcy Court). As a result of the Chapter 11 filings, all asbestos-related lawsuits against Aldrich and Murray have been stayed due to the imposition of a statutory automatic stay applicable in Chapter 11 bankruptcy cases. Only Aldrich and Murray have filed for Chapter 11 relief. Neither Aldrich's wholly-owned subsidiary, 200 Park, Inc. (200 Park), Murray's wholly-owned subsidiary, ClimateLabs LLC (ClimateLabs), Trane Technologies plc nor its other subsidiaries (the Trane Companies) are part of the Chapter 11 filings. In addition, at the request of Aldrich and Murray, the Bankruptcy Court has entered an order temporarily staying all asbestos-related claims against the Trane Companies that relate to claims against Aldrich or Murray (except for asbestos-related claims for which the exclusive remedy is provided under workers' compensation statutes or similar laws).

The goal of these Chapter 11 filings is to resolve equitably and permanently all current and future asbestos-related claims in a manner beneficial to claimants, Aldrich and Murray through court approval of a plan of reorganization that would create a trust pursuant to section 524(g) of the Bankruptcy Code, establish claims resolution procedures for all current and future asbestos-related claims against Aldrich and Murray and channel such claims to the trust for resolution in accordance with those procedures.

For detailed information on the bankruptcy cases of Aldrich and Murray, see:

- Part I, Item 1A, "Risk Factors - Risks Related to Litigation,"
- Part I, Item 3, "Legal Proceedings,"
- Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations - Significant Events," and
- Part II, Item 8, Consolidated Financial Statements, Note 1, "Description of Company," and Note 20, "Commitments and Contingencies."

Human Capital Management

Our people and culture are critical to achieving our operational, financial and strategic success.

As of December 31, 2023, we employed approximately 40,000 people in approximately 60 countries including over 15,000 outside of the United States. As of December 31, 2023, 25.9% of our global employees were women and 37.2% of our employees in the United States were racially and ethnically diverse. In 2023, 30.9% of our new hires globally were women and 53.0% of new hires in the United States were racially and ethnically diverse. Approximately 25.2% of leadership and management positions were held by women as of December 31, 2023. The diversity percentages included in this section exclude current year business acquisitions.

As a result of maintaining a consistent focus on an uplifting culture, our key talent (employees with the highest potential rating) retention rate excluding retirements in 2023 was 96.4%. Our company-wide (all employees) voluntary retention rate excluding retirements was 90.4%.

Culture and Purpose

In 2023, we continued to drive our purpose to boldly challenge what’s possible for a sustainable world through our strategic priorities and 2030 Sustainability Commitments. We use our Leadership Principles to guide our actions each day and enable our uplifting, engaging and inclusive culture. As part of our commitment to people and culture, we strive to create a work environment where our people uplift each other, make a positive impact on the planet and thrive at work and at home.

Since 2006, our annual employee engagement survey has enabled employees to share their experiences and perceptions of our Company. Employees provide ratings and written comments for continuous improvement. In 2023, 87% of our workforce participated in our annual engagement survey, and our overall employee engagement score remains high. While our work on culture is never done, these scores indicate that we’re continuing to raise the bar to increase pride, energy and optimism across the company and create the best employee experience.

Diversity and Inclusion

Our commitment to Diversity and Inclusion is core to our purpose and our 2030 Sustainability Commitments. We are proud members of Paradigm for Parity (a coalition of more than 100 corporations who have committed to closing the gender gap in corporate leadership) and OneTen (a coalition dedicated to closing the opportunity gap for Black talent and others in America). In addition, we are a 2017 signatory to the CEO Action for Diversity and Inclusion pledge (the largest CEO-driven business commitment to advance diversity and inclusion within the workplace).

We offer company-sponsored forums to promote diversity and inclusion in the workplace including:

- CEO Day of Understanding – a forum created to allow our employees and leaders to speak about their personal experiences and commitment to becoming allies and change agents. The spirit of this conversation is extended throughout our Diversity and Inclusion programming.
- Employee Resources Groups (ERGs) – we sponsor eight ERGs (the Women's Employee Network, the Black Employee Network, the Veterans ERG, the Asian ERG, the Global Organization of Latinos, the Lesbian, Gay, Bisexual, Transgender, Queer and Allies (LGBTQ+ Pride) ERG, the InterGenerational Employee Network, and VisAbility). All ERGs are voluntary, open and inclusive organizations that offer employees a sense of belonging, networking and learning opportunities.
- In 2023, the Inclusive Leader Learning Experience was promoted to people leaders detailing three stages of inclusive leadership: Becoming Aware, Becoming an Ally and Upstander, and Becoming a Change Agent. Our focus this year was on allyship, which was required for all global, salaried people leaders. In addition, we also launched a diversity, equity, and inclusion course through our compliance training for our North America salaried population.

- In 2023, the Global Diversity & Inclusion summit continued its focus on development of the inclusive leader behaviors; highlighting our focus this year of allyship.

Additionally, our corporate citizenship strategy, Sustainable Futures, which was launched in 2021, aims at providing access to science, technology, engineering, and mathematics (STEM) education and career opportunities specifically for people under-represented in our industry, including ethnic minorities and women. This strategy supports our efforts to create opportunity for all by providing underrepresented students with a range of resources, from classroom curriculum that introduces them to careers at a climate innovation company, to soft-skill development for landing a STEM job.

Learning and Development

We offer learning and career development opportunities that enhance our employees' skills and abilities and ensure contemporary technical and functional skills and competencies such as innovation, collaboration and leadership. Examples of these programs include:

- Team Leader Development Program – A seven-week experiential development program that engages, teaches and empowers front-line plant leaders to apply continuous improvement methods, make sound business decisions, solve problems, and serve as a coach to their teams.
- Graduate Training Program (GTP) – A five-month development program designed to prepare university graduate engineers for a rewarding career in technical sales. The program prepares sales engineers to sell Trane's complex HVAC systems and energy services. The program, started in 1926, is recognized as the industry's most comprehensive training program and provides intensive technical, business, sales, and leadership training.
- Accelerated Development Program (ADP) – An early career rotational program focused on both functional and leadership development, designed to build a pipeline of strong talent for key roles in the organization. Participants rotate to multiple geographic locations and business units during the 2.5-year program, while completing diverse assignments, and receiving dedicated functional training and developmental experiences.
- Leadership Development - We invest in custom, key transition leadership development programs for our high potential talent. We partner with best-in-class external leadership development experts such as INSEAD, Center for Creative Leadership, and the NeuroLeadership Institute to deliver these programs globally each year. Additionally, we offer our Trane Technologies people leaders learning programs to develop their skills in leading their teams, such as building diverse and inclusive teams, increasing engagement, and coaching skills.
- Professional development – We have numerous online courses in professional development skills as varied as working virtually, resiliency, Microsoft Teams, unconscious bias, and strategic capability initiatives such as product management and other programs that support our strategy of being a world class lean enterprise.
- Dependent Scholarships - To support learning in our employees' families, we offer $2,500 scholarships to support their dependent children's pursuits beyond high school, whether for a traditional degree, or a trade certification.
- Compliance Training – Our Compliance Training curriculum covers key topics that are important to protect our Company, our people and our customers. Topics include certification in our Code of Conduct, Information Security, Understanding and Preventing Workplace Harassment and Expense Management. All salaried employees globally complete our annual compliance curriculum.
- Women's Leadership Development Programs
    - The Women in Action Leadership Program is a virtual, self-paced cohort program that provides women with access to content that promotes their leadership development skills.
    - The Women on the Rise (WOR) program is designed over eight-weeks to help empower, develop, connect and support emerging women leaders.
    - The Women's Leadership Program (WLP) is a cohort program for high potential talent that provides an opportunity to network with other senior women leaders, gain individual insights through an executive mentoring partnership and build leadership skills and confidence through a variety of learning components, speakers, experiences and assessments.

Employee Volunteerism

In 2023, our employees continued to participate in a variety of volunteer activities. Our global teams made meaningful contributions to their local communities through the Trane Technologies Foundation's existing non-profit relationships, as well as through business and personal affiliations. In Charlotte, NC, some of our Trane Commercial technicians spent days volunteering in the Urban League's HVAC training class to help equip future technicians with first-hand insights that will get them off to a strong start on their future jobs. In Minneapolis, MN, employees used sustainability lesson plans we developed to teach middle-schoolers about concepts like food loss, green buildings, decarbonization and supply chain logistics to lead thought-provoking in-class lessons. Employees in China took a two-day trek into extremely rural Guizhou province to spend a day introducing STEM educational concepts to under-resourced classrooms. And in Monterrey, MX, teams upfitted a local school with new equipment, paint, and furnishing for their first information technology (IT) lab.

Behind these and other local efforts is a network of 55 Purple Teams comprised of more than 100 local champions who cultivate the spirit of volunteerism and ensure alignment with our strategy. These colleagues span each of our businesses and all of the markets where we operate, providing local guidance and inspiration to drive meaningful engagement with communities around the world.

Employee Well-being

Trane Technologies believes employees that can thrive at work, at home and in their communities are our greatest asset. We integrate well-being into our culture through core global resources that support physical, social, emotional, and financial well-being. Several elements of our holistic well-being actions include:

- Giving 100% of our team members access to company-sponsored wellness offerings, including a global Employee Assistance Program and a global wellness platform covering an array of topics like mindfulness, resiliency, and nutrition.
- Offering financial relief through the Helping Hand program, an employee funded program created to help associates facing financial hardship immediately after a qualified disaster or an unforeseen personal hardship.
- Providing flex time and flex place policies and resources as well as supporting flexible work arrangements, and other approaches to support evolving employee needs.

We recognize the pervasiveness of mental health challenges facing employees and their families. We continue efforts to overcome mental health stigmas and promote a culture that encourages and supports open discussion about mental health issues. We implemented a global mental health training program targeted towards people leaders and available to all employees. This program highlights how to recognize and react to mental health concerns and leverage support resources.

Our enterprise Mental Well-Being Hub provides streamlined access to mental health resources and guidance for supporting others. It also leverages our global Employee Assistance Program to provide frequent communications targeted to concerns such as mental health, stress & burnout, relationships, childcare and education.

Competitive Pay and Benefits

Trane Technologies' compensation programs and policies are designed to align the compensation of our employees with the Company's performance and strategy: to attract and retain a talented workforce and to meet the needs of employees globally. We are committed to providing competitive and equitable wages and benefits that will allow our employees to thrive at work and at home. In addition, the structure of our compensation programs balance incentive earnings for both long-term and short-term performance with our annual incentive plan closely tied to our 2030 sustainability commitments, which includes environmental sustainability and diversity and inclusion efforts, in addition to financial goals.

Trane Technologies' benefit programs and policies are designed to support the well-being of employees and their families. Purpose-driven and locally relevant benefit programs are provided globally. In addition to core and competitive medical, welfare and retirement programs, we offer programs to support work-life balance and deliver benefits access and opportunity to all. Key actions taken in 2023 illustrate this commitment, including:

- Introduction of fertility treatment benefits and extension of coverage to domestic partners and their qualified dependents within the Company-sponsored U.S. medical and other benefit plans;
- Enhanced family support programs through expanded adoption and surrogacy benefit support as well as inclusive child and elder back-up care programs; and
- Introduction of Roth and student debt support features in 401(k) plans to support meaningful retirement saving and overall financial wellbeing.

Our proxy statement provides more detail on the competitive compensation and benefit programs we offer.

Employee Safety

In 2023, we continued our multi-year, world class safety record with a Lost-time Incident Rate of 0.09 and Recordable Rate below 0.81. We continue to revise and update our safety programs in response to the most meaningful and impactful activities for all global employees. In 2023, this included a global campaign on hand safety which reduced our overall hand injuries within our manufacturing locations and field operations.

We also continue to maintain all our locations globally as tobacco free workplaces.

Available Information

We have used, and intend to continue to use, the homepage, the investor relations and the “News” section of our website (www.tranetechnologies.com), among other sources such as press releases, public conference calls and webcasts, as a means of disclosing additional information, which may include future developments regarding the Company and/or material non-public information. We encourage investors, the media, and others interested in our Company to review the information we make public in these locations on our website.

We file annual, quarterly, and current reports, proxy statements, and other documents with the Securities and Exchange Commission under the Securities Exchange Act of 1934.

This Annual Report on Form 10-K, as well as our quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to all of the foregoing reports, are made available free of charge on our Internet website (www.tranetechnologies.com) as soon as reasonably practicable after such reports are electronically filed with or furnished to the Securities and Exchange Commission. The Board of Directors of our Company has also adopted and posted in the Investor Relations section of our website the Corporate Governance Guidelines and charters for each of the Board’s standing committees. The contents of our website are not incorporated by reference in this report.

Executive Officers of the Registrant

The following is a list of our executive officers as of February 8, 2024.

Name and Age	Date of Service as an Executive Officer	Principal Occupation and Other Information for Past Five Years
David S. Regnery (61)	8/5/2017	Chair of the Board (since January 2022); Chief Executive Officer and Director (since July 2021); President and Chief Operating Officer (January 2020 to June 2021); Executive Vice President (September 2017 to December 2019)
Christopher J. Kuehn (51)	6/1/2015	Executive Vice President and Chief Financial Officer (since July 2021); Senior Vice President and Chief Financial Officer (March 2020 to June 2021); Vice President and Chief Accounting Officer (June 2015 to February 2020)
Paul A. Camuti (62)	8/1/2011	Executive Vice President, Chief Technology Officer and Sustainability Officer (since January 2024); Executive Vice President and Chief Technology and Strategy Officer (January 2020 to January 2024); Senior Vice President, Innovation and Chief Technology Officer (August 2011 to December 2019)
Raymond D. Pittard (58)	7/1/2021	Executive Vice President, Chief Integrated Supply Chain Officer (since January 2024); Executive Vice President, Supply Chain, Engineering and Information Technology (July 2021 to January 2024); Transformation Office Leader (December 2019 to June 2021); Vice President, SBU President of Transport Solutions North America and EMEA (December 2013 to December 2019)
Evan M. Turtz (55)	4/3/2019	Senior Vice President and General Counsel (since April 2019); Secretary (since October 2013); Vice President (2008-2019); Deputy General Counsel, Industrial, General Counsel, CTS (2016-2019)
Keith A. Sultana (54)	10/12/2015	Senior Vice President, Supply Chain and Operational Services (since January 2020); Senior Vice President, Global Operations and Integrated Supply Chain (October 2015-December 2019)
Mairéad A. Magner (46)	1/6/2022	Senior Vice President, Chief Human Resources Officer (since January 2022); Vice President, Talent and Organization Capability (January 2018 to January 2022)
Donald E. Simmons (52)	1/4/2024	Group President, Americas (since January 2024); Americas Segment Leader and CHVAC Americas President (January 2022 to December 2023); President, CHVAC Americas (January 2020 to December 2021);Vice President, SBU President of CHVAC North America and EMEA (September 2017 to December 2019)
Mark A. Majocha (52)	12/1/2022	Vice President and Chief Accounting Officer (since December 2022); Vice President, Finance CHVAC Americas (April 2020-November 2022); Vice President, Corporate Development (July 2018 - April 2020)

No family relationship exists between any of the above-listed executive officers of our Company. All officers are elected to hold office for one year or until their successors are elected and qualified.

Item 1A. **RISK FACTORS**

Our business, financial condition, results of operations, and cash flows are subject to a number of risks that could cause the actual results and conditions to differ materially from those projected in forward-looking statements contained in this Annual Report on Form 10-K. The risks set forth below are those we consider most significant. We face other risks, however, that we do not currently perceive to be material which could cause actual results and conditions to differ materially from our expectations. You should evaluate all risks before you invest in our securities. If any of the risks actually occur, our business, financial condition, results of operations or cash flows could be adversely impacted. In that case, the trading price of our ordinary shares could decline, and you may lose all or part of your investment.

Risks Related to Economic Conditions

Our global operations subject us to economic risks.

Our global operations are dependent upon products manufactured, purchased and sold in the U.S. and internationally. These activities are subject to risks that are inherent in operating globally, including:

- changes in local laws and regulations including potential imposition of currency restrictions, new or changing tax laws, variations in monetary policies, and other restraints;
- limitation of ownership rights, including expropriation of assets by a local government, and limitation on the ability to repatriate earnings;
- sovereign debt crises and currency instability in developed and developing countries;
- trade protection measures such as import or export restrictions and requirements, the imposition of burdensome tariffs and quotas or revocation or material modification of trade agreements;
- difficulty in staffing and managing global operations including supply chain disruptions which may be exacerbated by pandemics or other public health crises, natural disasters, or other events affecting the supply of labor, materials and components;
- difficulty of enforcing agreements, collecting receivables and protecting assets through non-U.S. legal systems;
- national and international conflict, including war, civil disturbances and terrorist acts; and
- recessions, economic downturns, price instability, slowing economic growth and social and political instability.

These risks could increase our cost of doing business internationally, increase our counterparty risk, disrupt our operations, disrupt the ability of suppliers and customers to fulfill their obligations, limit our ability to sell products in certain markets and have a material adverse impact on our results of operations, financial condition, and cash flows.

Commodity and raw material shortages, supply chain risks and price increases could adversely affect our financial results.

We rely on suppliers to secure commodities, particularly steel and non-ferrous metals, and third-party parts and components required for the manufacture of our products. A disruption in deliveries from our suppliers or decreased availability of commodities and third-party parts and components could have an adverse effect on our ability to meet our commitments to customers, increase our operating costs, or impact timing and delivery of products and services. Disruptions have occurred due to the COVID-19 pandemic, geopolitical events, electronic parts shortages, supplier capacity constraints, labor shortages, port congestion, logistical problems, political unrest, and other issues. Some of these disruptions have resulted in supply chain constraints affecting our business including our ability to timely produce and ship our products. The unavailability of some commodities and third-party parts and components could have a material adverse impact on our results of operations and cash flows.

Volatility in the prices of commodities and third-party parts and components or the impact of inflationary increases could increase the costs of our products and services. We may not be able to pass on these costs to our customers and this could have a material adverse impact on our results of operations and cash flows. Conversely, in the event there is deflation, we may experience pressure from our customers to reduce prices. There can be no assurance that we would be able to reduce our costs (through negotiations with suppliers or other measures) to offset any such price concessions which could adversely impact results of operations and cash flows. While we use financial derivatives or supplier price locks to partially hedge against this volatility, by using these instruments we may potentially forego the benefits that might result from favorable fluctuations in prices and could experience lower margins in periods of declining commodity prices. In addition, while hedging activity may minimize near-term volatility of the commodity prices, it would not protect us from long-term commodity price increases.

Some of our purchases are from sole or limited source suppliers for reasons of cost effectiveness, uniqueness of design, or product quality. If these suppliers encounter financial or operating difficulties, we might not be able to quickly establish or qualify replacement sources of supply.

We face significant competition in the markets that we serve.

The markets that we serve are highly competitive. We compete worldwide with a number of other manufacturers and distributors that produce and sell similar products. There has been consolidation and new entrants (including non-traditional competitors) within our industries and there may be future consolidation and new entrants which could result in increased competition and significantly alter the dynamics of the competitive landscape in which we operate. Due to our global footprint we are competing worldwide with large companies and with smaller, local operators who may have customer, regulatory or economic advantages in the geographies in which they are located. In addition, some of our competitors may employ pricing and other strategies that are not traditional. While we understand our markets and competitive landscape, there is always the risk of disruptive technologies coming from companies that are not traditionally manufacturers or service providers of our products. As we integrate acquisitions into our portfolio of solutions, we may face new competitors in our target markets. We must continually innovate new or enhanced products and services to maintain and expand our brand recognition and market leadership position to effectively compete in the markets that we serve. A failure or inability to effectively address market trends and compete in our market may adversely affect demand for our products and services, which may cause a material adverse effect on our financial condition.

Our growth is dependent, in part, on the timely development, commercialization and acceptance of new and enhanced products and services.

We must efficiently and effectively innovate, develop and commercialize new and enhanced products and services in a rapidly changing technological and business environment in order to remain competitive in our current and future markets and in order to continue to grow our business. The timely development and commercialization of new products and services and the enhancement of existing products and services is required to meet our customer demands, market trends, and regulatory requirements. The ongoing refreshment of our product and service offerings portfolio requires strategic choices of a significant investment of resources, anticipation of the opportunity and risks of new technologies, and the ability to compete with others who may have superior resources in specific technology domains. We cannot provide any assurance that any new or enhanced product or service will be successfully commercialized in a timely manner, if ever, or, if commercialized, will result in returns greater than our investment. Investment in a product or service could divert our attention and resources from other projects that become more commercially viable in the market. We also cannot provide any assurance that any new or enhanced product or service will be accepted by our current and future markets. Failure to timely and accurately predict customer needs and preferences, anticipate regulatory conditions affecting current and future products, mitigate supply chain disruptions on new products, or our failure to develop new and enhanced products and services that are accepted by these markets could have a material adverse impact on our competitive position, operations, financial condition, and cash flows.

Capital and credit market conditions could adversely affect our business operations, investments, and financial performance.

Instability in U.S. and global capital and credit markets, including market disruptions, limited liquidity and interest rate volatility, or reductions in the credit ratings assigned to us by independent rating agencies could reduce our access to capital markets or increase the cost of funding our short and long term credit requirements. In particular, if we are unable to access capital and credit markets, or access them on terms that are acceptable to us, we may not be able to make certain investments or fully execute our business plans and strategies. If we were to raise funding through the issuance of equity securities, our shareholders would experience dilution of their existing ownership interest. If we were to raise significant additional funds by issuing debt, we could be subject to limitations on our operations due to restrictive covenants or rating agencies could downgrade our credit ratings or put them on negative watch.

Our suppliers and customers are also dependent upon the capital and credit markets. Limitations on the ability of customers, suppliers or financial counterparties to access credit at interest rates and on terms that are acceptable to them could lead to insolvencies of key suppliers and customers, limit or prevent customers from obtaining credit to finance purchases of our products and services and cause delays in the delivery of key products from suppliers.

The performance of the financial markets and interest rates can also impact the value of our defined benefit pension plans and other post-retirement benefit programs. Significant decreases in discount rate or investment losses on plan assets may increase our funding obligations, which may adversely affect our financial results. See Note 11 – "Pensions and Postretirement Benefits Other Than Pensions."

Currency exchange rate fluctuations and other related risks may adversely affect our results.

We are exposed to a variety of market risks, including the effects of changes in currency exchange rates. See Part II Item 7A, “Quantitative and Qualitative Disclosure About Market Risk.”

We have operations throughout the world that manufacture and sell products in various international markets. As a result, we are exposed to movements in exchange rates of various currencies against the U.S. dollar as well as against other currencies throughout the world.

Many of our non-U.S. operations have a functional currency other than the U.S. dollar, and their results are translated into U.S. dollars for reporting purposes. Therefore, our reported results will be higher or lower depending on the weakening or strengthening of the U.S. dollar against the respective foreign currency. Decreased strength of the U.S. dollar could also adversely affect the cost of raw materials, products, or services that we purchase from non-U.S. suppliers.

We use derivative instruments to partially hedge those material exposures that cannot be naturally offset. The instruments utilized are viewed as risk management tools and are not used for trading or speculative purposes. To minimize the risk of counterparty non-performance, derivative instrument agreements are made only through major financial institutions with significant experience in such derivative instruments.

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

Changes in U.S. or foreign trade policies and other factors beyond our control may adversely impact our business and operating results

Changes in governmental policies on foreign trade, geopolitical tensions and trade disputes can disrupt supply chains and increase the cost of our products. This could cause our products to be more expensive for customers, which could reduce the demand for or attractiveness of such products. In addition, a geopolitical conflict in a region where we operate could disrupt our ability to conduct business operations in that region. Beyond tariffs and sanctions, countries also could adopt other measures, such as controls on imports or exports of goods, technology, or data, which could adversely affect our operations and supply chain and limit our ability to offer our products and services as intended. These kinds of restrictions could be adopted with little to no advanced notice, and we may not be able to effectively mitigate the adverse impacts from such measures. Political uncertainty surrounding trade or other international disputes also could have a negative impact on customer confidence and willingness to spend money, which could impair our future growth.

World geopolitical conflict, including the Russia Ukraine conflict, has created a humanitarian crisis, materially impacted economic activities, and may materially impact our global and regional operations.

The global economy has been negatively impacted by the military conflict between Russia and Ukraine. Governments including the U.S., United Kingdom, and those of the European Union have imposed export controls on certain products and financial and economic sanctions on certain industry sectors and parties in Russia which has triggered retaliatory sanctions by the Russian government and its allies. The outcome and future impacts of the conflict remain highly uncertain, continue to evolve and may grow more severe the longer the military action and sanctions remain in effect. Risks associated with the Russian-Ukrainian conflict, as well as other world geopolitical conflicts that have arisen or could arise in the future, include, but are not limited to, adverse effects on political developments and on general economic conditions, including inflation and consumer spending; disruptions to our supply chains; disruptions to our information systems, including through network failures, malicious or disruptive software, or cyberattacks; trade disruptions; energy shortages or rationing that may adversely impact our manufacturing facilities and consumer spending, particularly in Europe; rising fuel and/or rising costs of producing, procuring and shipping our products; our exposure to foreign currency exchange rate fluctuations; and constraints, volatility or disruption in the financial markets.

When Russia invaded Ukraine in February 2022, we immediately halted new orders and shipments into and out of Russia and Belarus. As of December 31, 2022, we had exited all business activity within these markets. To date, the Russia-Ukraine war has not had a material adverse effect on our business or financial performance.

We have no way to predict the progress or outcome of the situation in Ukraine. Until there is a peaceful resolution, the conflict could have a material adverse effect on our operations, results of operations, financial condition, liquidity, growth prospects and business outlook.

The full extent to which a resurgence of COVID-19, a new pandemic, or spread of new infectious diseases or other public health crises will affect us will depend on future developments that are highly uncertain and cannot be accurately predicted.

The COVID-19 pandemic has had widespread, rapidly evolving and unpredictable impacts on global society, economics, financial markets and business practices. Government efforts to contain COVID-19 have included travel bans and restrictions, quarantines, shelter in place orders and shutdowns. Our business and global operations have been impacted by supply chain delays, higher material costs and product prices, lower revenues for some quarters, and unfavorable foreign currency exchange rates. The COVID-19 pandemic has also at times affected our ability to obtain needed products and services, operate in certain locations, maintain our distribution channels, and attract and retain talent. We continue to closely monitor the impact of the COVID-19 pandemic on all aspects of our business and geographies, including how it has and will impact our customers, team members, suppliers, vendors, business partners and distribution channels.

The extent to which COVID-19 or other widespread outbreaks of infectious disease or other public health crises may impact our business going forward will depend on factors such as the duration and scope of infections; governmental, business, and individuals' actions in response to the health crisis; travel and other restrictions; and the impact on economic activity including the possibility of financial market instability or recession. How a resurgence of COVID-19 or other public health crises will affect us will depend on future developments that are highly uncertain and cannot be accurately predicted. Such events may also exacerbate other risks discussed herein, any of which could have a material adverse effect on us.

Risks Related to Litigation

Material adverse legal judgments, fines, penalties or settlements could adversely affect our results of operations or financial condition.

We and certain of our subsidiaries are currently and may in the future become involved in legal and regulatory proceedings and disputes incidental to the operation of our business or the business operations of previously-owned entities. Our business may be adversely affected by the outcome of these proceedings and other contingencies (including, without limitation, contract claims or other commercial disputes, product liability, product defects, environmental matters, and asbestos-related matters) that cannot be predicted with certainty. Moreover, any insurance or indemnification rights that we may have may be insufficient or unavailable to protect us against the total aggregate amount of losses sustained as a result of such proceedings and contingencies. As required by generally accepted accounting principles in the United States, we establish reserves based on our assessment of contingencies. Subsequent developments in legal proceedings and other events could affect our assessment and estimates of the loss contingency recorded as a reserve and we may be required to make additional material payments, which could have a material adverse impact on our liquidity, results of operations, financial condition, and cash flows. See also Part I, Item 3, “Legal Proceedings,” and Part II, Item 8, Consolidated Financial Statements Note 20, “Commitments and Contingencies.”

The Aldrich and Murray Chapter 11 cases involve various risks and uncertainties that could have a material effect on us.

Our indirect wholly-owned subsidiaries Aldrich and Murray have each filed a voluntary petition for reorganization under the Bankruptcy Code in the Bankruptcy Court. The goal of these Chapter 11 filings is to resolve equitably and permanently all current and future asbestos-related claims in a manner beneficial to claimants, Aldrich and Murray through court approval of a plan of reorganization that would create a trust pursuant to section 524(g) of the Bankruptcy Code, establish claims resolution procedures for all current and future asbestos-related claims against Aldrich and Murray and channel such claims to the trust for resolution in accordance with those procedures. Such a resolution, if achieved, would likely include a channeling injunction to enjoin asbestos claims resolved in the Chapter 11 cases from being filed or pursued against us or our affiliates. The Chapter 11 cases remain pending as of February 8, 2024.

There are a number of risks and uncertainties associated with these Chapter 11 cases, including, among others, those related to:

- the ability to consummate the agreement in principle reached with the court appointed legal representative of future asbestos claimants (the FCR);
- the outcome of negotiations with the committee representing current asbestos claimants (ACC) and other participants in the Chapter 11 cases, including insurers, concerning the terms of a plan of reorganization, including the size and structure of a potential section 524(g) trust to pay the asbestos liability of Aldrich and Murray and the means for funding that trust, and the risk that the ACC will object to, and the risk that insurers will not support, a plan of reorganization having terms acceptable to Aldrich and Murray;
- the actions of representatives of the asbestos claimants, including the ACC’s pursuit of certain causes of action against us, following the Bankruptcy Court’s grant of the ACC’s motion seeking standing to investigate and pursue certain causes of action at a hearing held on January 27, 2022, and other potential actions by the ACC in

opposition to, or otherwise inconsistent with, the efforts by Aldrich and Murray to diligently prosecute the Chapter 11 cases and ultimately seek Bankruptcy Court approval of a plan of reorganization;

- the decisions of the Bankruptcy Court relating to numerous substantive and procedural aspects of the Chapter 11 cases, including in connection with a proceeding by Aldrich and Murray to estimate their aggregate liability for asbestos claims, following the Bankruptcy Court’s grant of their motion seeking such a proceeding, and other efforts by Aldrich and Murray to diligently prosecute the Chapter 11 cases and ultimately seek Bankruptcy Court approval of a plan of reorganization, whether such decisions are in response to actions of representatives of the asbestos claimants or otherwise;
- the ultimate determination of the asbestos liability of Aldrich and Murray to be satisfied under a plan of reorganization pursuant to the court-approved estimation proceeding;
- the ability of Aldrich and Murray to obtain the necessary approvals of the Bankruptcy Court or the United States District Court for the Western District of North Carolina (the District Court) of a plan of reorganization;
- the decisions of the appellate courts regarding any orders of the Bankruptcy Court or the District Court that may be appealed, including the Bankruptcy Court's order dated December 28, 2023 denying the motions to dismiss the Chapter 11 cases brought by the ACC and certain individual claimants and any orders of the Bankruptcy Court or District Court approving a plan of reorganization;
- any orders approving a plan of reorganization and issuing the channeling injunction not becoming final and non-appealable;
- the terms and conditions of any plan of reorganization that is ultimately confirmed in the Chapter 11 cases;
- delays in the confirmation or effective date of a plan of reorganization due to factors beyond the Company’s control; and
- the risk that the ultimate amount required under any final plan of reorganization may exceed the amounts agreed to with the FCR in the Plan.

The ability of Aldrich and Murray to successfully reorganize and resolve their asbestos liabilities will depend on various factors, including their ability to reach agreements with representatives of the asbestos claimants on the terms of a plan of reorganization that satisfies all applicable legal requirements and to obtain the requisite court approvals of such plan, and remains subject to the risks and uncertainties described above. We cannot ensure that Aldrich and Murray can successfully reorganize, nor can we give any assurances as to the amount of the ultimate obligations under the Funding Agreements or any plan of reorganization, or the resulting impact on our financial condition, results of operations or future prospects. We also are unable to predict the timing of any of the foregoing matters or the timing for a resolution of the Chapter 11 cases, all of which could have an impact on us.

It also is possible that, in the Chapter 11 cases, various parties will be successful in bringing claims against us and other related parties, including by successfully challenging the 2020 corporate restructuring, consolidating entities and/or raising allegations that we are liable for the asbestos-related liabilities of Aldrich and Murray as set forth in certain pleadings filed by the ACC in the Chapter 11 cases. Although we believe we have no such responsibility for liabilities of Aldrich and Murray, except indirectly through our obligation to provide funding to Aldrich and Murray under the terms of the Funding Agreements, we cannot provide assurances that such claims will not be successful.

In sum, the outcome of the Chapter 11 cases is uncertain and there is uncertainty as to what extent we may have to contribute to a section 524(g) trust under the Funding Agreements.

For detailed information on the bankruptcy cases of Aldrich and Murray, see Part I, Item 1, “Business - Asbestos-Related Matters,” Part I, Item 3, “Legal Proceedings,” Part II, Item 7, “Management's Discussion and Analysis of Financial Condition and Results of Operations - Significant Events,” and Part II, Item 8, Consolidated Financial Statements, Note 1, “Description of Company,” and Note 20, “Commitments and Contingencies.”

Risks Related to Cybersecurity and Technology

We are subject to risks relating to our information technology systems.

We rely extensively on information technology systems, some of which are supported by third party vendors including cloud-based systems and managed service providers, to manage and operate our business. We invest in new information technology systems designed to improve our operations. These information technology systems can be damaged, disrupted or shut down due to cyberattacks, computer viruses, ransomware, human error or malfeasance (including by employees), power outages,

hardware failures, telecommunication or utility failures, catastrophes or other unforeseen events. If these systems cease to function properly, if these systems experience security breaches or disruptions or if these systems do not provide the anticipated benefits or if we are unable to commit sufficient resources to maintain and enhance our information technology infrastructure to keep pace with continuous development in information processing technology, our ability to manage our operations could be impaired, which could have a material adverse impact on our results of operations, financial condition, and cash flows.

Security breaches or disruptions of the technology systems, infrastructure or products of the Company or our vendors could negatively impact our business and financial results.

Our information technology systems, networks and infrastructure and technology embedded in certain of our control products have been and are at risk to cyber attacks and unauthorized security intrusions. From time to time, vulnerabilities in our products are discovered and updates are made available, but customers are at risk until those updates are applied or other mitigating actions are taken by customers to protect their systems and networks. Like other large companies, certain of our information technology systems and the systems of our vendors have been subject to computer viruses, malicious code, unauthorized access, phishing attempts, denial-of-service attacks and other cyber attacks and we expect that we and our vendors will be subject to similar attacks in the future. We and some of our third-party suppliers have experienced cyber-based attacks, and, due to the evolving threat landscape, may continue to experience attacks, potentially with more frequency and severity. We continue to make investments and adopt measures designed to enhance our protection, detection, response, and recovery capabilities, and to mitigate potential risks to our technology, products, services and operations from potential cyber-attacks.

The methods used to obtain unauthorized access, disable or degrade service, or sabotage information technology systems are constantly changing and evolving. Despite having instituted security policies and business continuity plans, and implementing and regularly reviewing and updating processes and procedures to protect against unauthorized access and requiring similar protections from our vendors, the ever-evolving threats mean we are continually evaluating and adapting our systems and processes and ask our vendors to do the same, and there is no guarantee that such systems and processes will be adequate to safeguard against all data security breaches or misuses of data. Hardware, software or applications we develop or obtain from third parties sometimes contain defects in design or deployment or other problems that could unexpectedly result in security breaches or disruptions. Open source software components embedded into certain software that we use has in the past contained vulnerabilities and others may be discovered in the future. Such vulnerabilities can expose our systems to malware or allow third party access to data. While these issues are not specific to our Company, we are required to take action when such vulnerabilities are identified including patching and modification to certain of our products and enterprise systems. To date, there has been no material business impact from such vulnerabilities, but we continue to monitor these issues and our responses are ongoing. Our systems, networks and certain of our control products and those of our vendors are at risk to system damage, malicious attacks from hackers, employee errors or misconduct, viruses, power and utility outages, and other catastrophic events. Any of these incidents could cause significant harm to our business by negatively impacting our business operations, compromising the security of our proprietary information or the personally identifiable information of our customers, employees and business partners which may be subject to privacy and security laws, regulations and other controls. These events potentially expose us to litigation or other legal actions against us or the imposition of penalties, fines, fees or liabilities. Such events could have a material adverse impact on our results of operations, financial condition and cash flows and could damage our reputation which could adversely affect our business. Our insurance coverage may not be adequate to cover all the costs related to a cybersecurity attack or disruptions resulting from such attacks. Customers are increasingly requiring cybersecurity protections and mandating cybersecurity standards in our products, and we may incur additional costs to comply with such demands.

Data privacy and protection laws are evolving and present increasing compliance challenges.

The regulatory environment surrounding data privacy and protection is increasingly demanding, with the frequent imposition of new and changing requirements across businesses and geographic areas. We are required to comply with complex regulations when collecting, transferring and using personal data, which increases our costs, affects our competitiveness and can expose us to substantial fines or other penalties.

Intellectual property infringement claims of others and the inability to protect our intellectual property rights could harm our competitive position.

Our intellectual property (IP) rights are important to our business and include numerous patents, trademarks, copyrights, trade secrets, proprietary technology, technical data, business processes, and other confidential information. Although in aggregate we consider our intellectual property rights to be valuable to our operations, we do not believe that our business is materially dependent on a single intellectual property right or any group of them. In our opinion, engineering, production skills and experience are more responsible for our market position than our patents and/or licenses.

Nonetheless, this intellectual property may be subject to challenge, infringement, invalidation or circumvention by third parties. Despite extensive security measures, our intellectual property may be subject to misappropriation through unauthorized access of our information technology systems, employee theft, or theft by private parties or foreign actors, including those affiliated with or controlled by state actors. Our business and competitive position could be harmed by such events. Our ability to protect our intellectual property rights by legal recourse or otherwise may be limited, particularly in countries where laws or enforcement practices are inadequate or undeveloped. Our inability to enforce our IP rights under any of these circumstances could have an impact on our competitive position and business.

Risks Related to Regulatory Matters

Our reputation, ability to do business and results of operations could be impaired by improper conduct by any of our employees, agents or business partners.

We are subject to regulation under a wide variety of U.S. federal and state and non-U.S. laws, regulations and policies, including laws related to anti-corruption, anti-human trafficking, anti-bribery, export and import compliance, anti-trust, cybersecurity, data privacy, and money laundering, due to our global operations. We cannot provide assurance our internal controls will always protect us from the improper conduct of our employees, agents and business partners. Any violations of law or improper conduct could damage our reputation and, depending on the circumstances, subject us to, among other things, civil and criminal penalties, material fines, equitable remedies (including profit disgorgement and injunctions on future conduct), securities litigation and a general loss of investor confidence, any one of which could have a material adverse impact on our business prospects, financial condition, results of operations, cash flows, and the market value of our stock.

Our operations are subject to regulatory risks.

Our U.S. and non-U.S. operations are subject to a number of laws and regulations, including among others, laws related to the environment, commercial trade, and health and safety. We have made, and will be required to continue to make, significant expenditures to comply with these laws and regulations. Any violations of applicable laws and regulations could lead to significant penalties, fines or other sanctions. Changes in current laws and regulations could require us to increase our compliance expenditures, cause us to significantly alter or discontinue offering existing products and services or cause us to develop new products and services. Altering current products and services or developing new products and services to comply with changes in the applicable laws and regulations could require significant research and development investments, increase the cost of providing the products and services and adversely affect the demand for our products and services. The U.S. federal government and various states and municipalities have enacted or may enact legislation intended to deny government contracts to U.S. companies that reincorporate outside of the U.S. or have reincorporated outside of the U.S or may take other actions negatively impacting such companies. If we are unable to effectively respond to changes to applicable laws and regulations, interpretations of applicable laws and regulations, or comply with existing and future laws and regulations, our competitive position, results of operations, financial condition and cash flows could be materially adversely impacted.

Global climate change and related regulations could negatively affect our business.

Climate change presents immediate and long-term risks to our Company and to our customers, with the risks expected to increase over time, including, among others, acute physical risks (such as flooding, hurricanes, or wildfires) or chronic physical risks (such as droughts, heat waves, or sea level changes). Our products and operations are subject to and affected by environmental regulation by federal, state and local authorities in the U.S. and regulatory authorities with jurisdiction over our international operations, including with respect to the use, storage, and dependence upon refrigerants which are considered greenhouse gases. Refrigerants are essential to many of our products and there is concern regarding the global warming potential of such materials. As such, national, regional and international regulations and policies are being implemented to curtail the use of certain refrigerants. Some of these regulations could have a negative competitive impact on our company by requiring us to make costly changes to our products. As regulations reduce the use and potential availability of the current class of widely used refrigerants, we are developing and selling our next generation products that utilize lower global warming potential solutions. There can be no assurance that climate change or environmental regulation or deregulation will not have a negative competitive impact on our ability to sell our products or that economic returns will match the investment that we are making in new product development. We face increasing complexity related to product design, the availability and use of regulated materials, the associated energy consumption and efficiency related to the use of products, the transportation and shipping of products, climate change regulations, and the reuse, recycling and/or disposal of products and their components at end-of-use or useful life as we adjust to new and future requirements relating to our transition to a more circular economy. There continues to be a lack of consistent climate legislation, which creates economic and regulatory uncertainty. Such regulatory uncertainty extends to future incentives for energy efficient buildings and vehicles and costs of compliance, which may impact the demand for our products, obsolescence of our products and our results of operations.

Our climate commitment requires us to offer a full line of next generation products by 2030 without compromising safety or energy efficiency. Additionally, in 2019, we announced our 2030 commitment which targets reducing one gigaton – one billion metric tons – of carbon emissions (CO_2e) from our customers' footprint by 2030. While we are committed to pursuing these sustainability objectives, there can be no assurance that we will successfully achieve our commitments. Failure to meet these commitments could result in reputational and other harm to our company. Changes regarding climate risk management and practices may result in higher regulatory, compliance risks and costs.

Risks Related to Our Business Operations

Our business strategy includes acquiring businesses, product lines, technologies and capabilities, plants and other assets, entering into joint ventures and making investments that complement our existing businesses. We also occasionally divest businesses that we own. We may not identify acquisition or joint venture candidates or investment opportunities at the same rate as the past. Acquisitions, dispositions, joint ventures and investments that we identify could be unsuccessful or consume significant resources, which could adversely affect our operating results.

We continue to analyze and evaluate the acquisition and divestiture of strategic businesses and product lines, technologies and capabilities, plants and other assets, joint ventures and investments with the potential to, among other things, strengthen our industry position, enhance our existing set of product and services offerings, increase productivity and efficiencies, grow revenues, earnings and cash flow, help us stay competitive or reduce costs. There can be no assurance that we will identify or successfully complete transactions with suitable candidates in the future, that we will consummate these transactions at rates similar to the past or that completed transactions will be successful. Strategic transactions may involve significant cash expenditures, debt incurrence, operating losses and expenses that could have a material adverse effect on our business, financial condition, results of operations and cash flows. Such transactions involve numerous other risks, including:

- diversion of management time and attention from daily operations;
- difficulties integrating acquired businesses, technologies and personnel into our business, including doing so without high costs;
- difficulties in obtaining and verifying the financial statements and other business and other due diligence information of acquired businesses;
- inability to obtain required regulatory approvals and/or required financing on favorable terms;
- potential loss of key employees, key contractual relationships or key customers of either acquired businesses or our business;
- assumption of the liabilities and exposure to unforeseen or undisclosed liabilities of acquired businesses and exposure to regulatory sanctions;
- inheriting internal control deficiencies;

- dilution of interests of holders of our common shares through the issuance of equity securities or equity-linked securities; and
- in the case of joint ventures and other investments, interests that diverge from those of our partners without the ability to direct the management and operations of the joint venture or investment in the manner we believe most appropriate to achieve the expected value.

Any acquisitions, divestitures, joint ventures or investments may ultimately harm our business, financial condition, results of operations and cash flows. There are additional risks related to our Reverse Morris Trust transaction, see Part IA, Item 1A, “Risk Factors - Risks Related to the Transactions” for more information.

Natural disasters, epidemics or other unexpected events may disrupt our operations, adversely affect our results of operations and financial condition, and may not be fully covered by insurance.

The occurrence of one or more catastrophic events including hurricanes, fires, earthquakes, floods and other forms of severe weather, health epidemics or pandemics or other contagious outbreaks or other catastrophic events, including wars, conflicts, or terrorism in the U.S. or in other countries in which we operate or are located could adversely affect our operations and financial performance. Natural disasters, power outages, health epidemics or pandemics or other contagious outbreaks or other unexpected events, including wars, conflicts, or acts of terrorism, could result in physical damage to and complete or partial closure of one or more of our plants, temporary or long-term disruption of our operations by causing business interruptions, material scarcity, price volatility or supply chain disruptions. Climate change is a risk multiplier with respect to these physical disasters in both frequency and severity and may affect our global business operations as a result. Existing insurance arrangements may not provide full protection for the costs that may arise from such events, particularly if such events are catastrophic in nature or occur in combination. The occurrence of any of these events could increase our insurance and other operating costs or harm our sales in affected areas.

Our business success depends on attracting, developing, and retaining highly qualified talent.

The skills, experience, and industry knowledge of our employees significantly benefit our operations and performance. The market for employees and leaders with certain skills and experiences is very competitive, and difficulty attracting, developing, and retaining members of our management team and key employees could have a negative effect on our business, operating results, and financial condition. Maintaining a positive and inclusive culture and work environment, offering attractive compensation, benefits, and development opportunities, and effectively implementing processes and technology that enable our employees to work effectively and efficiently are important to our ability to attract and retain employees.

Our business may be adversely affected by temporary work stoppages, union negotiations, labor disputes and other matters associated with our labor force.

Certain of our employees are covered by collective bargaining agreements or works councils. We experience from time-to-time temporary work stoppages, union negotiations, labor disputes and other matters associated with our labor force and some of these events could result in significant increases in our cost of labor, impact our productivity or damage our reputation. Additionally, a work stoppage at one of our suppliers could materially and adversely affect our operations if an alternative source of supply were not readily available. Stoppages by employees of our customers could also result in reduced demand for our products.

Risks Relating to Tax Matters

Changes in tax or other laws, regulations or treaties, changes in our status under U.S. or non-U.S. laws or adverse determinations by taxing or other governmental authorities could increase our tax burden or otherwise affect our financial condition or operating results, as well as subject our shareholders to additional taxes.

The taxes associated with our operations and corporate structure could be impacted by changes in tax or other laws, treaties or regulations or the interpretation or enforcement thereof by the U.S. or non-U.S. tax or other governmental authorities. Even after legislation is enacted, further guidance, regulations and technical corrections pertaining to the legislation continue to be issued by the tax authorities, some of which may have retroactive application. We continue to monitor and review new guidance and regulations as they are issued, as any changes could have a material adverse effect on our financial statements. In addition, governmental authorities are actively engaged in formulating new legislative proposals. Any future legislative changes to the tax laws and judicial or regulatory interpretation thereof, the geographic mix of earnings, changes in overall profitability, and other factors could also materially impact our effective tax rate.

We continue to monitor for other tax changes, U.S. (including state and local) and non-U.S. related, which can also adversely impact our overall tax burden. From time to time, proposals have been made and/or legislation has been introduced to change the tax laws, regulations or interpretations thereof of various jurisdictions or limit tax treaty benefits that if enacted or implemented could materially increase our tax burden and/or effective tax rate and could have a material adverse impact on our financial condition and results of operations. Moreover, the Organisation for Economic Co-operation and Development (OECD) has released proposals to create an agreed set of international rules for fighting base erosion and profit shifting, including Pillar One and Pillar Two, such that tax laws in countries in which we do business could change on a prospective or retroactive basis, and any such changes could adversely impact us. On December 12, 2022, the European Union (EU) Member States agreed in principle on the introduction of a global minimum tax rate (proposed 15% minimum tax rate). On December 18, 2023, Ireland enacted laws related to this minimum tax, effective January 1, 2024. We are continuing to evaluate the potential impacts of proposed and enacted legislative changes, in Ireland and elsewhere. We anticipate an increase to our global effective tax rate related to these changes.

In addition to the above, the European Commission has been very active in investigating whether various tax regimes or private tax rulings provided by a country to particular taxpayers may constitute State Aid. We cannot predict the outcome of any of these potential changes or investigations in any of the jurisdictions, but if any of the above occurs and impacts us, this could materially increase our tax burden and/or effective tax rate and could have a material adverse impact on our financial condition and results of operations.

While we monitor proposals and other developments that would materially impact our tax burden and/or effective tax rate and investigate our options, we could still be subject to increased taxation on a prospective basis no matter what action we undertake if certain legislative proposals or regulatory changes are enacted, certain tax treaties are amended and/or our interpretation of applicable tax or other laws is challenged and determined to be incorrect. In particular, any changes and/or differing interpretations of applicable tax law that have the effect of disregarding the shareholders' decision to reorganize in Ireland, limiting our ability to take advantage of tax treaties between jurisdictions, modifying or eliminating the deductibility of various currently deductible payments, or increasing the tax burden of operating or being resident in a particular country could subject us to increased taxation.

In addition, tax authorities periodically review tax returns filed by us and can raise issues regarding our filing positions, timing and amount of income or deductions, and the allocation of income among the jurisdictions in which we operate. These examinations on their own, or any subsequent litigation related to the examinations, may result in additional taxes or penalties against us. If the ultimate result of these audits differs from our original or adjusted estimates, they could have a material impact on our tax provision.

Risks Related to our Reverse Morris Trust Transaction

On February 29, 2020 (Distribution Date), we completed our Reverse Morris Trust transaction (the Transaction) with Gardner Denver Holdings, Inc. (Gardner Denver, which changed its name to Ingersoll Rand Inc. (Ingersoll Rand) after the Transaction) whereby we distributed Ingersoll-Rand U.S. HoldCo, Inc., which contained our former Industrial segment (Ingersoll Rand Industrial) through a pro rata distribution (the Distribution) to shareholders of record as of February 24, 2020 (Spin-off Shareholders). Ingersoll Rand Industrial then merged with a wholly-owned subsidiary of Ingersoll Rand. Upon close of the Transaction, the Spin-off Shareholders received approximately 50.1% of the shares of Ingersoll Rand common stock on a fully-diluted basis and Gardner Denver shareholders retained approximately 49.9% of the shares of Ingersoll Rand on a fully diluted basis. As a result, Spin-off Shareholders received 0.8824 shares of Ingersoll Rand common stock with respect to each share of our stock owned as of February 24, 2020. In connection with the Transaction, we received a special cash payment of $1.9 billion.

If the Distribution as part of our Reverse Morris Trust Transaction is determined to be taxable for Irish tax purposes, significant Irish tax liabilities may arise for the Spin-off Shareholders.

We received an opinion from Irish Revenue regarding certain tax matters associated with the Distribution, as well as a legal opinion from our Irish counsel Arthur Cox LLP, regarding certain Irish tax consequences of the Distribution for the Spin-off Shareholders. For the Spin-off Shareholders who are not resident or ordinarily resident in Ireland for Irish tax purposes and who do not hold their shares in connection with a trade or business carried on by such Spin-off Shareholders through an Irish branch or agency, we consider, based on both opinions taken together, that no adverse Irish tax consequences for such Spin-off Shareholders should have arisen. These opinions relied on certain facts and assumptions and certain representations. Notwithstanding the opinion from Irish Revenue, Irish Revenue could ultimately determine on audit that the Distribution is taxable for Irish tax purposes, for example, if it determines that any of these facts, assumptions or representations are not correct or have been violated. A legal opinion represents the tax adviser’s best legal judgment and is not binding on Irish Revenue or the courts and Irish Revenue or the courts may not agree with the legal opinion. In addition, the legal opinion is based on current law and cannot be relied upon if current law changes with retroactive effect. If the Distribution ultimately is determined to be taxable for Irish tax purposes, we and the Spin-off Shareholders could have significant Irish tax liabilities as a result of the

Distribution, and there could be a material adverse impact on our business, financial condition, results of operations and cash flows in future reporting periods.

If the Distribution together with certain related transactions do not qualify as tax-free under Sections 355 and 368(a) of the Internal Revenue Code, including as a result of subsequent acquisitions of stock of the Company or Ingersoll Rand, then the Company and the Spin-off Shareholders may be required to pay substantial U.S. federal income taxes, and Ingersoll Rand may be obligated to indemnify the Company for such taxes imposed on the Company.

At the time of the Distribution, we received an opinion from our U.S. tax counsel Paul, Weiss, Rifkind, Wharton & Garrison LLP (Paul Weiss) substantially to the effect that, for U.S. federal income tax purposes, the Distribution together with certain related transactions undertaken in anticipation of the Distribution and taking into account the merger of Ingersoll Rand Industrial with the wholly-owned subsidiary of Ingersoll Rand will qualify as a tax-free transaction under Sections 368(a), 361 and 355 of the Internal Revenue Code (the Code), with the result that we and the Spin-off Shareholders will not recognize any gain or loss for U.S. federal income tax purposes as a result of the spin-off. The opinion of our counsel was based on, among other things, certain representations and assumptions as to factual matters made by Ingersoll Rand, Ingersoll Rand Industrial and the Company. The failure of any factual representation or assumption to be true, correct and complete in all material respects could adversely affect the validity of the opinion of counsel. An opinion of counsel represents counsel's best legal judgment, is not binding on the Internal Revenue Service (IRS) or the courts, and the IRS or the courts may not agree with the opinion. In addition, an opinion will be based on current law, and cannot be relied upon if current law changes with retroactive effect. If the Distribution, and/or related internal transactions in anticipation of the Distribution ultimately are determined to be taxable, we could incur significant U.S. federal income tax liabilities, which could cause a material adverse impact on our business, financial condition, results of operations and cash flows in future reporting periods, although if this determination resulted from certain actions taken by Ingersoll Rand Industrial or Ingersoll Rand, Ingersoll Rand would be required to bear the cost of any resultant tax liability pursuant to the terms of the Tax Matters Agreement dated February 29, 2020, among Ingersoll-Rand Plc, Ingersoll-Rand Lux International Holding Company S.à r.l, Ingersoll-Rand Services Company, Ingersoll-Rand U.S. HoldCo, Inc., and Gardner Denver Holdings, Inc. (Tax Matters Agreement).

The Distribution will be taxable to the Company pursuant to Section 355(e) of the Code if there is a 50% or greater change in ownership of either the Company or Ingersoll Rand Industrial, directly or indirectly (including through such a change in ownership of Ingersoll Rand), as part of a plan or series of related transactions that include the Distribution. A Section 355(e) change of ownership would not make the Distribution taxable to the Spin-off Shareholders, but instead may result in corporate-level taxable gain to certain of our subsidiaries. Because the Spin-off Shareholders will collectively be treated as owning more than 50% of the Ingersoll Rand common stock following the merger, the merger alone should not cause the Distribution to be taxable to our subsidiaries under Section 355(e). However, Section 355(e) might apply if other acquisitions of stock of the Company before or after the merger, or of Ingersoll Rand before or after the merger, are considered to be part of a plan or series of related transactions that include the Distribution together with certain related transactions. If Section 355(e) applied, certain of our subsidiaries might recognize a very substantial amount of taxable gain, although if this applied as a result of certain actions taken by Ingersoll Rand Industrial, Ingersoll Rand or certain specified Ingersoll Rand stockholders, Ingersoll Rand would be required to bear the cost of any resultant tax liability under Section 355(e) pursuant to the terms of the Tax Matters Agreement.

If the merger does not qualify as a tax-free reorganization under Section 368(a) of the Code, the Spin-off Shareholders may be required to pay substantial U.S. federal income taxes.

On the Distribution Date, we have received an opinion from Paul Weiss, and Ingersoll Rand received an opinion from their counsel Simpson Thacher & Bartlett LLP, substantially to the effect that the merger will qualify as a reorganization within the meaning of Section 368(a) of the Code with the result that U.S. holders of Ingersoll Rand Industrial common stock who received Ingersoll Rand common stock in the merger will not recognize any gain or loss for U.S. federal income tax purposes (except with respect to cash received in lieu of fractional shares of Ingersoll Rand common stock). These opinions were based upon, among other things, certain representations and assumptions as to factual matters made by Ingersoll Rand, the Company, Ingersoll Rand Industrial and the merger subsidiary used by Ingersoll Rand. The failure of any factual representation or assumption to be true, correct and complete in all material respects could adversely affect the validity of the opinions. An opinion of counsel represents counsel's best legal judgment, is not binding on the IRS or the courts, and the IRS or the courts may not agree with the opinion. In addition, the opinions are based on current law, and cannot be relied upon if current law changes with retroactive effect. If the merger were taxable, U.S. holders of the common stock of Ingersoll Rand Industrial would be considered to have made a taxable sale of their Ingersoll Rand Industrial common stock to Ingersoll Rand, and such U.S. holders of Ingersoll Rand Industrial would generally recognize taxable gain or loss on their receipt of Ingersoll Rand common stock in the merger.

Risks Related to Our Irish Domicile

Irish law differs from the laws in effect in the United States and may afford less protection to holders of our securities.

The United States currently does not have a treaty with Ireland providing for the reciprocal recognition and enforcement of judgments in civil and commercial matters. As such, there is some uncertainty as to whether the courts of Ireland would recognize or enforce judgments of U.S. courts obtained against us or our directors or officers based on U.S. federal or state civil liability laws, including the civil liability provisions of the U.S. federal or state securities laws, or hear actions against us or those persons based on those laws.

As an Irish company, we are governed by the Irish Companies Act, which differs in some material respects from laws generally applicable to U.S. corporations and shareholders, including, among others, differences relating to interested director and officer transactions, indemnification of directors and shareholder lawsuits. Likewise, the duties of directors and officers of an Irish company generally are owed to the company only. Shareholders of Irish companies generally do not have a personal right of action against directors or officers of the company and may exercise such rights of action on behalf of the company only in limited circumstances. Accordingly, holders of our securities may have more difficulty protecting their interests than would holders of securities of a corporation incorporated in a jurisdiction of the United States. In addition, Irish law does not allow for any form of legal proceedings directly equivalent to the class action available in the United States.

Irish law allows shareholders to authorize share capital which then can be issued by a board of directors without shareholder approval. Also, subject to specified exceptions, Irish law grants statutory pre-emptive rights to existing shareholders to subscribe for new issuances of shares for cash but allows shareholders to authorize the waiver of the statutory pre-emptive rights with respect to any particular allotment of shares. Under Irish law, we must have authority from our shareholders to issue any shares, including shares that are part of the Company’s authorized but unissued share capital. In addition, unless otherwise authorized by its shareholders, when an Irish company issues shares for cash to new shareholders, it is required first to offer those shares on the same or more favorable terms to existing shareholders on a pro-rata basis. If we are unable to obtain these authorizations from our shareholders or are otherwise limited by the terms of our authorizations, our ability to issue shares or otherwise raise capital could be adversely affected.

Dividends received by our shareholders may be subject to Irish dividend withholding tax.

In certain circumstances, we are required to deduct Irish dividend withholding tax (currently at the rate of 25%) from dividends paid to our shareholders. In the majority of cases, shareholders resident in the United States will not be subject to Irish withholding tax, and shareholders resident in a number of other countries will not be subject to Irish withholding tax provided that they complete certain Irish dividend withholding tax forms. However, some shareholders may be subject to withholding tax, which could have an adverse impact on the price of our shares.

Dividends received by our shareholders could be subject to Irish income tax.

Dividends paid in respect of our shares will generally not be subject to Irish income tax where the beneficial owner of these dividends is exempt from dividend withholding tax, unless the beneficial owner of the dividend has some connection with Ireland other than his or her shareholding in Trane Technologies plc.

Our shareholders who receive their dividends subject to Irish dividend withholding tax will generally have no further liability to Irish income tax on the dividends unless the beneficial owner of the dividend has some connection with Ireland other than his or her shareholding in Trane Technologies plc.

Item 1B. **UNRESOLVED STAFF COMMENTS**

None.

Item 1C. **CYBERSECURITY**

We maintain a cybersecurity risk assessment program and framework as set forth in our cybersecurity policies and standards. The foundation of our cybersecurity program is based on the National Institute of Standards and Technology ("NIST") Cybersecurity Framework, which includes a set of controls to prevent, detect, and respond to cybersecurity threats and incidents. These controls include constant monitoring, log collection and analysis, threat hunting and intelligence surveillance, and regular vulnerability scans/penetration tests. Additionally, in furtherance of assessing, identifying and managing material cybersecurity risks, we:

- Leverage technology solutions, including proactive detection tools, to protect our assets and detect threats in our environment;

- Perform regular internal assessments of our cybersecurity program against the NIST Cybersecurity Framework. The results of these assessments are then reviewed and, based on such findings, action plans are developed and progress tracked through completion;
- Analyze both internal and external cybersecurity incidents and related threat intelligence to determine applicability to our environment and industry. Findings from such analyses are then reviewed and utilized to create action plans where applicable and relevant to our environment and industry;
- Maintain an enterprise-wide disaster recovery governance program, which includes cybersecurity-related disaster recovery standards and compliance procedures related thereto;
- Regularly perform cybersecurity-related disaster recovery testing to ensure that the Company's mission-critical systems are recoverable, in support of the business continuity needs of our various business lines; and
- Integrate each of our business and corporate groups with our internal cybersecurity team to ensure cybersecurity requirements are embedded into operating environments as appropriate, which drives business strategies, budgeting, and similar processes. In addition, senior and executive management, as well as our Board of Directors, regularly review our financial planning processes for these areas, inclusive of our cybersecurity programs.

Any changes or additions to our cybersecurity risk assessment program and related practices and procedures described above in response to cybersecurity needs are reviewed by our executive management, Board of Directors and Audit Committee.

We regularly engage independent third-parties and auditors to assess our cybersecurity program and practices and assist in the mitigation of risk. The effectiveness of our cybersecurity environment is regularly tested by internal personnel and these third-parties. These assessments are performed in connection with standards and requirements under the Payment Card Industry (PCI) data security standard, Sarbanes-Oxley Act (SOX), and the U.S. Department of Defense, cybersecurity capability maturity benchmarking and voluntary certifications by us, such as the Service Organization Control Type 2 (SOC 2). The results of these audits and assessments are promptly reviewed and enhancements are made to our cybersecurity program and practices based on such findings as appropriate. We also maintain a cybersecurity third party risk management program which evaluates systems and applications hosted by external parties for cybersecurity risks and assesses the security posture and features of those services. The program includes initial review, ongoing monitoring and contractual agreements with cybersecurity requirements to ensure third party services meet our standards for such providers, and the cybersecurity risks associated with the use of these services is acceptable.

Like other comparable-sized companies, our information technology systems, networks and infrastructure and technology embedded in certain of our control products have been and may continue to be vulnerable to cyber-attacks and unauthorized security intrusions. These types of attacks may include computer viruses, malicious code, unauthorized access, phishing attempts, denial-of-service attacks, among others. For more information about these and other cybersecurity risks faced by us, see Part IA, Item 1A, "Risk Factors - Risks Related to Cybersecurity and Technology."

Our Board of Directors has ultimate oversight for risks relating to our cybersecurity program and practices and receives regular updates from our internal cybersecurity team on cybersecurity risks and threats. In addition, our Audit Committee provides Board-level oversight for management's actions with respect to practices, procedures and controls used to identify, assess and manage our key cybersecurity programs and risks. We also maintain an Enterprise Risk Intelligence Committee (ERIC), a management-level cross-functional group designed to monitor and mitigate risks, including cybersecurity risks, that pose a threat to our strategic objectives. The ERIC is charged with providing guidance and direction for integrating enterprise risk intelligence with important business processes, such as strategic planning, business forecasting, operational management, and investment allocation to ensure consistent consideration of risks in decision making. Finally, we maintain an Enterprise Cybersecurity Governance Committee that presents updates on cybersecurity initiatives, known and emerging issues and risks, and program updates to a cross-section of our senior management.

Item 2. PROPERTIES

As of December 31, 2023, we owned or leased approximately 29 million square feet of space worldwide. Manufacturing and assembly operations are conducted in 39 plants across the world. We also maintain various warehouses, offices, technology centers, and repair centers throughout the world. The majority of our plant facilities are owned by us with the remainder under long-term lease arrangements. We believe that our plants have been well maintained, are generally in good condition and are suitable for conducting our business.

The locations by segment of our principal plant facilities at December 31, 2023 were as follows:

Americas	EMEA	Asia Pacific
Arecibo, Puerto Rico	Barcelona, Spain	Bangkok, Thailand
Charlotte, North Carolina	Bari, Italy	Taicang, China
Clarksville, Tennessee	Charmes, France	Wujiang, China
Columbia, South Carolina	Conselve, Italy	Zhongshan, China
Fort Smith, Arkansas	Essen, Germany	
Fremont, Ohio	Galway, Ireland	
Grand Rapids, Michigan	Golbey, France	
Greenville, South Carolina	Jettingen-Scheppach, Germany	
Hastings, Nebraska	King Abdullah Economic City, Saudi Arabia	
La Crosse, Wisconsin	Kolin, Czech Republic	
Lynn Haven, Florida	Tribano, Italy	
Marietta, Ohio	Wittenberg, Germany	
Monterrey, Mexico		
Newberry, South Carolina		
Noblesville, Indiana		
Pueblo, Colorado		
Rushville, Indiana		
St. Paul, Minnesota		
Trenton, New Jersey		
Tyler, Texas		
Vidalia, Georgia		
Waco, Texas		

Item 3. LEGAL PROCEEDINGS

In the normal course of business, we are involved in a variety of lawsuits, claims and legal proceedings, commercial and contract disputes, employment matters, product liability and product defect claims, asbestos-related claims, environmental liabilities, intellectual property disputes, and tax-related matters. In our opinion, pending legal matters are not expected to have a material adverse impact on our results of operations, financial condition, liquidity or cash flows.

The most significant litigation facing the Company is the asbestos-related bankruptcy cases of Aldrich and Murray. For detailed information on the bankruptcy cases of Aldrich and Murray, see Part I, Item 1, "Business - Asbestos-Related Matters," Part I, Item 1A, "Risk Factors - Risks Related to Litigation," Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations - Significant Events," and Part II, Item 8, Consolidated Financial Statements, Note 1, "Description of Company," and Note 20, "Commitments and Contingencies."

Item 4. MINE SAFETY DISCLOSURES

None.

PART II

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

Information regarding the principal market for our ordinary shares and related shareholder matters is as follows:

Our ordinary shares are traded on the New York Stock Exchange under the symbol TT. As of February 2, 2024, the approximate number of record holders of ordinary shares was 2,315.

Issuer Purchases of Equity Securities

The following table provides information with respect to purchases of our ordinary shares during the quarter ended December 31, 2023:

Period	Total number of shares purchased (000's) (a) (b)	Average price paid per share (a) (b)	Total number of shares purchased as part of program (000's) (a)	Approximate dollar value of shares still available to be purchased under the program ($000's) (a)
October 1 - October 31	454.1	$ 198.69	453.8	$ 2,649,773
November 1 - November 30	186.7	226.59	186.7	2,607,465
December 1 - December 31	326.9	235.53	326.6	2,530,541
Total	967.7	$ 216.52	967.1	

(a) Share repurchases are made from time to time in accordance with management's capital allocation strategy, subject to market conditions and regulatory requirements. Repurchases occur in the open market or through one or more other public or private transactions pursuant to plans complying with Rules 10b5-1 under the Exchange Act. In February 2022, our Board of Directors authorized the repurchase of up to $3.0 billion of our ordinary shares (2022 Authorization). During the fourth quarter of 2023, we repurchased approximately $209 million of our ordinary shares, consistent with our capital allocation strategy, leaving $2.5 billion remaining under the 2022 Authorization as of December 31, 2023.

(b) We may also reacquire shares outside of the repurchase program from time to time in connection with the surrender of shares to cover taxes on vesting of share-based awards. We reacquired 335 shares in October and 320 shares in December in transactions outside the repurchase programs.

Securities Trading Plans of Directors and Executive Officers

Our director compensation program, which consists of an annual cash retainer and grant of restricted stock units (RSUs), is designed to compensate non-employee directors fairly for work required for a company of our size and scope and to align their interests with the long-term interests of our shareholders. Similarly, a portion of the compensation of our executive officers is delivered in the form of our Long-Term Incentive Program (LTI), which is comprised of stock options, RSUs and performance share units (PSUs). We believe compensating our directors and executive officers with a mix of equity-based awards effectively links compensation to long-term shareholder value creation, Environmental, Social, and Governance (ESG), and financial results.

Subject to the satisfaction of our share ownership requirements, our directors and executive officers may, from time to time, engage in transactions to sell some of the shares granted to them as part of our director and executive compensation programs after such shares vest following the expiration of any time-based restrictions or achievement of certain pre-established performance goals. In addition, our directors and executive officers may also, from time to time, engage in other transactions involving our securities, which may entail the purchase or sale of our common stock outside of these compensation programs on an open-market basis.

All transactions in our securities by our directors and executive officers must occur in accordance with our Insider Trading Policy, which, among other things, requires that such transactions be in accordance with applicable U.S. federal securities laws that prohibit trading while in possession of material nonpublic information. Rule 10b5-1 of the Securities Exchange Act provides an affirmative defense that enables prearranged transactions in securities in a manner that avoids concerns about initiating transactions at a future date while possibly in possession of material nonpublic information. Our insider trading policy permits our directors and executive officers to enter trading plans designed to prearrange transactions in our securities in accordance with Rule 10b5-1.

The following table describes contracts, instructions or written plans for the sale or purchase of our securities adopted by our directors and executive officers during the fourth quarter of 2023, each of which is intended to satisfy the affirmative defense conditions of Rule 10b5-1(c), referred to as Rule 10b5-1 trading plans:

Name and Title	Action	Date of Action	Scheduled Expiration Date[(1)]	Aggregate Number of Securities to be Purchased or Sold[(2)]
David S. Regnery *Chair and Chief Executive Officer*	Adopt	11/14/2023	5/13/2024	Sale of up to 19,772[(3)] shares of common stock
Christopher J. Kuehn *Executive Vice President and Chief Financial Officer*	Adopt	11/14/2023	5/13/2024	Sale of up to 10,699[(4)] shares of common stock

(1) In each case a trading plan may also expire prior to the scheduled expiration date if all transactions under the trading plan are completed before the scheduled expiration date.

(2) Aggregate number of shares in this column includes shares that may be forfeited or withheld to satisfy exercise price and tax obligations at the time of vesting.

(3) This figure includes a grant of 8,727 unvested PSUs that are expected to vest during the term of the Rule 10b5-1 trading plans, which are assumed to vest at 100% of the target award amount. The actual number of PSUs that may vest can vary between 0% - 200% of the target award amount, subject to the achievement of certain performance conditions as set forth in the PSU award agreement.

(4) This figure includes a grant of 6,713 unvested PSUs that are expected to vest during the term of the Rule 10b5-1 trading plans, which are assumed to vest at 100% of the target award amount. The actual number of PSUs that may vest can vary between 0% - 200% of the target award amount, subject to the achievement of certain performance conditions as set forth in the PSU award agreement.

Performance Graph

The following graph compares the cumulative total shareholder return on our ordinary shares with the cumulative total return on (i) the Standard & Poor's 500 Stock Index and (ii) the Standard & Poor's 500 Industrial Index for the five years ended December 31, 2023. The graph assumes an investment of $100 in our ordinary shares, the Standard & Poor's 500 Stock Index and the Standard & Poor's 500 Industrial Index on December 31, 2018 and assumes the reinvestment of dividends.

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Company/Index	2018	2019	2020	2021	2022	2023
Trane Technologies	100	148	213	300	254	374
S&P 500	100	131	156	200	164	207
S&P 500 Industrials Index	100	129	144	174	164	194

Item 6. [Reserved]

Item 7. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following Management’s Discussion and Analysis of Financial Condition and Results of Operations contains forward-looking statements that involve risks and uncertainties. Our actual results may differ materially from the results discussed in the forward-looking statements. Factors that might cause a difference include, but are not limited to, those discussed under Item 1A. Risk Factors in this Annual Report on Form 10-K. The following section is qualified in its entirety by the more detailed information, including our financial statements and the notes thereto, which appears elsewhere in this Annual Report.

This section discusses 2023 and 2022 significant items affecting our consolidated operating results, financial condition and liquidity and provides a year-to-year comparison between 2023 and 2022. Discussions of 2021 significant items and year-to-year comparisons between 2022 and 2021 have been excluded in this Form 10-K and can be found in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 of our Annual Report on Form 10-K for year ended December 31, 2022.

Overview

Organizational

Trane Technologies plc is a global climate innovator. We bring sustainable and efficient solutions to buildings, homes and transportation through our strategic brands, Trane® and Thermo King®, and our environmentally responsible portfolio of products, services and connected intelligent controls.

2030 Sustainability Commitments

Our commitment to sustainability extends to the environmental and social impacts of our people, operations, products and services. We have announced ambitious 2030 Sustainability Commitments, including our Gigaton Challenge to reduce customers' carbon emissions by a billion metric tons. We are one of a handful of companies whose emissions reductions targets have been validated three times by the SBTi, and one of the very few companies worldwide and first in our industry whose net-zero targets have also been validated. Our emissions reduction commitments align with the Paris Climate Accord net-zero targets, consistent with limiting global temperature rise to no more than 1.5 °C. Our 2030 Sustainability Commitments for scopes 1, 2, and 3 will guide our emissions reduction efforts through 2030, with an emphasis on reducing our largest source: the emissions generated from customer use of our products. We are Leading by Example as we make progress toward carbon-neutral operations and zero waste-to-landfill across our global footprint and net positive water use in water-stressed locations. Our Opportunity for All commitment focuses on gender parity in leadership, workforce diversity reflective of our communities, and a citizenship strategy that helps underserved communities through enhanced learning environments and pathways to green and Science, Technology, Engineering and Math (STEM) careers.

Recent Acquisitions

On May 2, 2023, we completed the acquisition of MTA S.p.A (MTA), a leading industrial process cooling technology business, which brings complementary, high-performing solutions to the comprehensive Commercial HVAC product and services portfolio. The results of the acquisition are reported within the EMEA and Americas segments.

On May 12, 2023, we completed the acquisition of Helmer Scientific Inc (Helmer), a precision temperature cooling company in the life sciences vertical. The results of the acquisition are reported within the Americas segment.

On November 2, 2023, we completed the acquisition of Nuvolo Technologies Corporation (Nuvolo), a global leader in modern, cloud-based enterprise asset management and connected workplace software and solutions. The results of the acquisition are reported within the Americas segment.

Significant Events

Reorganization of Aldrich and Murray

On June 18, 2020 (Petition Date), our indirect wholly-owned subsidiaries, Aldrich and Murray each filed a voluntary petition for reorganization under the Bankruptcy Code. As a result of the Chapter 11 filings, all asbestos-related lawsuits against Aldrich and Murray have been stayed due to the imposition of a statutory automatic stay applicable in Chapter 11 bankruptcy cases. Only Aldrich and Murray have filed for Chapter 11 relief. Neither Aldrich's wholly-owned subsidiary, 200 Park, Murray's wholly-owned subsidiary, ClimateLabs, nor the Trane Companies are part of the Chapter 11 filings.

The goal of these Chapter 11 filings is to resolve equitably and permanently all current and future asbestos-related claims in a manner beneficial to claimants, Aldrich and Murray through court approval of a plan of reorganization that would create a trust pursuant to section 524(g) of the Bankruptcy Code, establish claims resolution procedures for all current and future asbestos-related claims against Aldrich and Murray and channel such claims to the trust for resolution in accordance with those procedures.

Aldrich and its wholly-owned subsidiary 200 Park and Murray and its wholly-owned subsidiary ClimateLabs were deconsolidated as of the Petition Date and their respective assets and liabilities were derecognized from our Consolidated Financial Statements.

In 2021, Aldrich and Murray reached an agreement in principle with the court-appointed legal representative of future asbestos claimants (the FCR) and filed a motion to create a $270.0 million trust intended to constitute a "qualified settlement fund" within the meaning of the Treasury Regulations under Section 468B of the Internal Revenue Code (QSF). On January 27, 2022, the Bankruptcy Court granted the request to fund the QSF, which was funded on March 2, 2022, resulting in an operating cash outflow of $270.0 million reported in our Consolidated Statements of Cash Flows, of which $91.8 million was allocated to continuing operations and $178.2 million was allocated to discontinued operations for the year ended December 31, 2022.

On April 6, 2023, certain individual claimants filed a motion to dismiss the Chapter 11 cases. Subsequently, on May 15, 2023, the committee representing current asbestos claimants (the ACC) filed its own motion to dismiss the Chapter 11 cases. Aldrich, Murray and the FCR filed responses in opposition to each of these motions, and the Company filed papers joining in Aldrich and Murray's opposition. A hearing on the motions to dismiss was held on July 14, 2023. On December 28, 2023, the Bankruptcy Court entered an order denying the motions to dismiss the Chapter 11 cases. On January 11, 2024, the ACC and the individual claimants filed motions seeking leave to appeal the order denying the motions to dismiss and to certify the appeals directly to the Court of Appeals for the Fourth Circuit. Aldrich and Murray filed responses in opposition to these motions on January 31, 2024. It is not possible to predict how the Bankruptcy Court will rule on these pending motions, whether an appellate court will affirm or reverse the Bankruptcy Court order denying the motions to dismiss, whether the Bankruptcy Court will approve the terms of the Plan, what the extent of the asbestos liability will be or how long the Chapter 11 cases will last. The Chapter 11 cases remain pending as of February 8, 2024.

For detailed information on the bankruptcy cases of Aldrich and Murray, see Part I, Item 1, "Business - Asbestos-Related Matters," Part I, Item 1A, "Risk Factors - Risks Related to Litigation," Part I, Item 3, "Legal Proceedings," and Part II, Item 8, Consolidated Financial Statements, Note 1, "Description of Company," and Note 20, "Commitments and Contingencies."

Trends and Economic Events

We are a global corporation with worldwide operations. As a global business, our operations are affected by worldwide, regional and industry-specific economic factors as well as political and social factors wherever we operate or do business. Our geographic diversity and the breadth of our product and services portfolios have helped mitigate the impact of any one industry or the economy of any single country on our consolidated operating results.

Given our broad range of products manufactured and geographic markets served, management uses a variety of factors to predict the outlook for the Company. We monitor key competitors and customers in order to gauge relative performance and the outlook for the future. We regularly perform detailed evaluations of the different market segments we are serving to proactively detect trends and to adapt our strategies accordingly, including potential triggers and actions to be taken under recessionary scenarios. In addition, we believe our backlog and order levels are indicative of future revenue and thus are a key measure of anticipated performance.

We expect market conditions to remain mixed across our end markets and geographies where we serve customers. Overall Commercial HVAC markets remain strong due to demand for our differentiated customer driven solutions and the benefits of installing energy efficient products and decarbonizing the built environment, aided by supportive policies and regulations especially in the United States and Europe. Transport refrigeration markets are experiencing lower demand as customers adjust to lower freight rates. Residential markets have been normalizing as lead times return to normal and distributors adjust inventory levels.

We continue to see material, wage and energy inflation impact our cost structure. However, disruptions in the global supply chain and resource constraints have improved throughout the year. Our performance may be impacted by future developments that are uncertain. Geopolitical risks and macroeconomic events could cause disruptions to operations, supply chains and end markets, tightening credit conditions, higher interest rates, global banking uncertainty and the possibility of deteriorating overall economic conditions which could negatively impact our business.

We believe we have a solid foundation of global brands that are highly differentiated in all of our major product lines. Our geographic mix and the diversity of our portfolio, coupled with our large installed product base, provides growth opportunities from replacement demand and within our service revenue stream. In addition, we are investing substantial resources to innovate and develop new products and services which we expect to drive future growth.

Results of Operations

Non-GAAP Financial Measures

Organic Revenue

We define organic revenue as net revenues adjusted for the impact of currency, acquisitions and divestitures. Organic revenue is not defined under generally accepted accounting principles in the United States of America (GAAP) and may not be comparable to similarly-titled measures used by other companies and should not be considered a substitute for revenue as determined in accordance with GAAP. Selected references are made to revenue growth on an organic basis so that certain financial results can be viewed without the impact of fluctuations in foreign currency rates and with the impacts of acquisitions, thereby providing comparisons of operation performance from period to period of the business that we have owned during both periods presented. We believe organic revenue growth provides investors with useful supplemental information about our revenues in both periods presented.

Segment Adjusted EBITDA

Management measures segment operating performance based on net earnings excluding interest expense, income taxes, depreciation and amortization, restructuring, non-cash adjustment for contingent consideration, insurance settlements on property claims, merger and acquisition related costs, impairment of an equity investment, unallocated corporate expenses and discontinued operations (Segment Adjusted EBITDA). Segment Adjusted EBITDA is not defined under GAAP and may not be comparable to similarly-titled measures used by other companies and should not be considered a substitute for net earnings or other results reported in accordance with GAAP. We believe Segment Adjusted EBITDA provides the most relevant measure of profitability as well as earnings power and the ability to generate cash. This measure is a useful financial metric to assess our operating performance from period to period by excluding certain items that we believe are not representative of our core business and we use this measure for business planning purposes. Segment Adjusted EBITDA also provides a useful tool for assessing the comparability between periods and our ability to generate cash, service debt and undertake capital expenditures because it eliminates non-cash charges such as depreciation and amortization expense.

Year Ended December 31, 2023 Compared to the Year Ended December 31, 2022 - Consolidated Results

Dollar amounts in millions	2023	2022	Period Change	2023 % of revenues	2022 % of revenues
Net revenues	$ 17,677.6	$ 15,991.7	$ 1,685.9		
Cost of goods sold	(11,820.4)	(11,026.9)	(793.5)	66.9%	69.0%
Gross profit	5,857.2	4,964.8	892.4	33.1%	31.0%
Selling and administrative expenses	(2,963.2)	(2,545.9)	(417.3)	16.7%	15.9%
Operating income	2,894.0	2,418.9	475.1	16.4%	15.1%
Interest expense	(234.5)	(223.5)	(11.0)		
Other income/(expense), net	(92.2)	(23.3)	(68.9)		
Earnings before income taxes	2,567.3	2,172.1	395.2		
Provision for income taxes	(498.4)	(375.9)	(122.5)		
Earnings from continuing operations	2,068.9	1,796.2	272.7		
Discontinued operations, net of tax	(27.2)	(21.5)	(5.7)		
Net earnings	$ 2,041.7	$ 1,774.7	$ 267.0		

Net Revenues

Net revenues for the year ended December 31, 2023 increased by 10.5%, or $1,685.9 million, compared with the same period of 2022.

The components of the period change were as follows:

Pricing	4.4	%
Volume	4.3	%
Organic revenue [1]	8.7	%
Acquisitions	2.1	%
Currency translation	(0.3)	%
Total	10.5	%

[1] Represents a non-GAAP measure. For more information, see "Non-GAAP Financial Measures."

The increase in *Net revenues* was primarily driven by realization of inflation-based price increases, higher volumes driven by increased end-customer demand within all our reportable segments and incremental revenue from acquisitions, partially offset by an unfavorable impact from foreign currency translation. Refer to "Results by Segment" below for a discussion of *Net revenues* by segment.

Gross Profit Margin

Gross profit margin for the year ended December 31, 2023 increased 210 basis points to 33.1% compared to 31.0% for the same period of 2022 primarily due to price realization and gross productivity, partially offset by inflation and business reinvestment.

Selling and Administrative Expenses

Selling and administrative expenses for the year ended December 31, 2023 increased by 16.4%, or $417.3 million, compared with the same period of 2022. The increase in *Selling and administrative expenses* was primarily driven by an increase in human capital costs related to investing in our people, higher sales commissions and merger and acquisition costs, including additional headcount, amortization of intangibles and transaction driven costs. *Selling and administrative expenses* as a percentage of *Net revenues* for the year ended December 31, 2023 increased 80 basis points from 15.9% to 16.7%.

Interest Expense

Interest expense for the year ended December 31, 2023 increased by 4.9% or $11.0 million compared with the same period of 2022 primarily due to the issuance of $700.0 million of 5.250% senior notes due March 2033 and interest costs associated with commercial paper issued during the period, partially offset by the redemption of $700.0 million of 4.250% senior notes due June 2023. We had no commercial paper outstanding as of December 31, 2023.

Provision for Income Taxes

The 2023 effective tax rate was 19.4% which was lower than the U.S. Statutory rate of 21% due to a net $30.3 million reduction in valuation allowances primarily related to deferred tax assets associated with both foreign tax credits and operations of international subsidiaries. Additional items that impact the effective tax rate are excess tax benefits from employee share-based payments and earnings in non-U.S. jurisdictions, which in aggregate have a lower effective tax rate offset by an impairment of an equity investment, which is currently nondeductible, and U.S. state and local taxes. Revenues from non-U.S. jurisdictions accounted for approximately 28% of our total 2023 revenues, such that a material portion of our pretax income was earned and taxed outside the U.S. at rates ranging from 0% to 38%. When comparing the results of multiple reporting periods, among other factors, the mix of earnings between U.S. and foreign jurisdictions can cause variability in our overall effective tax rate.

The 2022 effective tax rate was 17.3% which was lower than the U.S. Statutory rate of 21% due to a $48.2 million reduction in valuation allowances primarily related to certain net state deferred tax assets resulting from U.S. legal entity restructurings and deferred tax assets associated with foreign tax credits as a result of an increase in the current year amount of creditable foreign source income. Additional tax benefits included in the 2022 effective rate are $12.4 million, net related to the effects of a prepayment of an intercompany obligation in 2021, excess tax benefits from employee share-based payments and earnings in non-U.S. jurisdictions, which in aggregate have a lower effective tax rate. These amounts were partially offset by U.S. state and local taxes and certain non-deductible employee expenses. Revenues from non-U.S. jurisdictions accounted for approximately 28% of our total 2022 revenues, such that a material portion of our pretax income was earned and taxed outside the U.S. at rates ranging from 0% to 38%.

On December 18, 2023, Ireland enacted legislation related to the 15% minimum tax element of the OECD's tax reform initiative, commonly referred to as "Pillar Two," effective January 1, 2024. We are continuing to evaluate the potential impacts of proposed and enacted legislative changes as new guidance becomes available. The legislation does not impact our 2023 effective tax rate; however, we anticipate it will increase our effective tax rate beginning in 2024.

Year Ended December 31, 2023 Compared to the Year Ended December 31, 2022 - Segment Results

We operate under four regional operating segments designed to create deep customer focus and relevance in markets around the world. The Company determined that its two Europe, Middle East and Africa (EMEA) operating segments meet the aggregation criteria based on similar operating and economic characteristics, resulting in one reportable segment. Therefore, the Company has three regional reportable segments, Americas, EMEA and Asia Pacific. In January 2024, we aligned our operating segments with our three regional reportable segments.

- Our Americas segment innovates for customers in North America and Latin America. The Americas segment encompasses commercial heating, cooling and ventilation systems, building controls and solutions, and energy services and solutions; residential heating and cooling; and transport refrigeration systems and solutions.
- Our EMEA segment innovates for customers in the Europe, Middle East and Africa region. The EMEA segment encompasses heating, cooling and ventilation systems, services and solutions for commercial buildings, and transport refrigeration systems and solutions.
- Our Asia Pacific segment innovates for customers throughout the Asia Pacific region. The Asia Pacific segment encompasses heating, cooling and ventilation systems, services and solutions for commercial buildings and transport refrigeration systems and solutions.

The following discussion compares our results for each of our three reportable segments for the year ended December 31, 2023 compared to the year ended December 31, 2022.

Dollar amounts in millions	**2023**	**2022**	**% Change**
Americas			
Net revenues	$ 13,832.0	$ 12,640.8	9.4 %
Segment Adjusted EBITDA	2,669.6	2,326.3	14.8 %
Segment Adjusted EBITDA as a percentage of net revenues	19.3 %	18.4 %	
EMEA			
Net revenues	$ 2,401.2	$ 2,034.5	18.0 %
Segment Adjusted EBITDA	464.7	338.1	37.4 %
Segment Adjusted EBITDA as a percentage of net revenues	19.4 %	16.6 %	
Asia Pacific			
Net revenues	$ 1,444.4	$ 1,316.4	9.7 %
Segment Adjusted EBITDA	321.3	248.3	29.4 %
Segment Adjusted EBITDA as a percentage of net revenues	22.2 %	18.9 %	
Total Net revenues	$ 17,677.6	$ 15,991.7	10.5 %
Total Segment Adjusted EBITDA	3,455.6	2,912.7	18.6 %
Total Segment Adjusted EBITDA as a percentage of net revenues	19.5 %	18.2 %	

Americas

Net revenues for the year ended December 31, 2023 increased by 9.4% or $1,191.2 million, compared with the same period of 2022.

The components of the period change were as follows:

Pricing	4.5	%
Volume	4.1	%
Organic revenue [(1)]	8.6	%
Acquisitions	1.0	%
Currency translation	(0.2)	%
Total	9.4	%

[(1)] Represents a non-GAAP measure. For more information, see "Non-GAAP Financial Measures."

The increase in *organic revenue* was primarily driven by the realization of inflation-based price increases and higher volumes led by strong demand for both equipment and services within our Commercial HVAC business, partially offset by the normalization of markets within our Residential business and the softening of transport markets.

The increase in revenue from acquisitions includes a Commercial HVAC independent dealer acquired in April 2022, MTA and Helmer which were acquired in May 2023, and Nuvolo which was acquired in November 2023. Together these acquisitions increased *Net revenues* in our Americas segment by 1.0% compared to the corresponding prior-year period.

Segment Adjusted EBITDA margin for the year ended December 31, 2023 increased by 90 basis points to 19.3% compared to 18.4% for the same period of 2022 primarily due to price realization and gross productivity, partially offset by inflation and business reinvestment.

EMEA

Net revenues for the year ended December 31, 2023 increased by 18.0% or $366.7 million, compared with the same period of 2022.

The components of the period change were as follows:

Pricing	5.1	%
Volume	3.1	%
Organic revenue [(1)]	8.2	%
Acquisitions	8.4	%
Currency translation	1.4	%
Total	18.0	%

[(1)] Represents a non-GAAP measure. For more information, see "Non-GAAP Financial Measures."

The increase in *organic revenue* was primarily driven by the realization of inflation-based price increases and higher volumes led by strong demand for both equipment and services within our Commercial HVAC business.

The increase in revenue from acquisitions includes AL-KO Air Technology (AL-KO) which was acquired in October 2022 and MTA which was acquired in May 2023. Together these acquisitions increased *Net revenues* in our EMEA segment by 8.4% compared to the corresponding prior-year period.

Segment Adjusted EBITDA margin for the year ended December 31, 2023 increased by 280 basis points to 19.4% compared to 16.6% for the same period of 2022 primarily due to price realization, gross productivity and higher volumes, partially offset by inflation, lower margin attribution from recent acquisitions, inclusive of integration costs, and continued business reinvestment.

Asia Pacific

Net revenues for the year ended December 31, 2023 increased by 9.7% or $128.0 million, compared with the same period of 2022.

The components of the period change were as follows:

Pricing	2.6	%
Volume	7.6	%
Organic revenue [(1)]	10.2	%
Acquisitions	2.9	%
Currency translation	(3.4)	%
Total	9.7	%

[(1)] Represents a non-GAAP measure. For more information, see "Non-GAAP Financial Measures."

The increase in *organic revenue* was primarily driven by higher volumes related to increased end-customer demand and the realization of inflation-based price increases for both equipment and services within our Commercial HVAC business.

In October 2022, we acquired AL-KO, which increased *Net revenues i*n our Asia Pacific segment by 2.9% compared to the prior-year period.

Segment Adjusted EBITDA margin for the year ended December 31, 2023 increased by 330 basis points to 22.2% compared to 18.9% for the same period of 2022 primarily due to price realization, higher volumes and gross productivity, partially offset by lower margin attribution from the recent acquisition, inclusive of integration costs, and continued business reinvestment.

Liquidity and Capital Resources

We assess our liquidity in terms of our ability to generate cash to fund our operating, investing and financing activities. In doing so, we review and analyze our current cash on hand, the number of days our sales are outstanding, inventory turns, capital expenditure commitments and income tax payments. Our cash requirements primarily consist of the following:

- Funding of working capital
- Debt service requirements
- Funding of capital expenditures
- Dividend payments
- Funding of acquisitions, joint ventures and equity investments
- Share repurchases

Our primary sources of liquidity include cash balances on hand, cash flows from operations, proceeds from debt offerings, commercial paper, and borrowing availability under our existing credit facilities. We earn a significant amount of our operating income in jurisdictions where it is deemed to be permanently reinvested. Our most prominent jurisdiction of operation is the U.S. We expect existing cash and cash equivalents available to the U.S. operations, the cash generated by our U.S. operations, our committed credit lines as well as our expected ability to access the capital and debt markets will be sufficient to fund our U.S. operating and capital needs for at least the next twelve months and thereafter for the foreseeable future. In addition, we expect existing non-U.S. cash and cash equivalents and the cash generated by our non-U.S. operations will be sufficient to fund our non-U.S. operating and capital needs for at least the next twelve months and thereafter for the foreseeable future. The maximum aggregate amount of unsecured commercial paper notes available to be issued, on a private placement basis, under the commercial paper program is $2.0 billion, of which we had no outstanding balance as of December 31, 2023.

As of December 31, 2023, we had $1,095.3 million of cash and cash equivalents on hand, of which $949.0 million was held by non-U.S. subsidiaries. Cash and cash equivalents held by our non-U.S. subsidiaries are generally available for use in our U.S. operations via intercompany loans, equity infusions or via distributions from direct or indirectly owned non-U.S. subsidiaries for which we do not assert permanent reinvestment. As a result of the Tax Cuts and Jobs Act in 2017, additional repatriation opportunities to access cash and cash equivalents held by non-U.S. subsidiaries have been created. In general, repatriation of cash to the U.S. can be completed with no significant incremental U.S. tax. However, to the extent that we repatriate funds from non-U.S. subsidiaries for which we assert permanent reinvestment to fund our U.S. operations, we would be required to accrue and pay applicable non-U.S. taxes. As of December 31, 2023, we currently have no plans to repatriate funds from subsidiaries for which we assert permanent reinvestment.

Share repurchases are made from time to time in accordance with management's balanced capital allocation strategy, subject to market conditions and regulatory requirements. In February 2022, our Board of Directors authorized the repurchase of up to $3.0 billion of our ordinary shares (2022 Authorization) upon the completion of our $2.0 billion ordinary share repurchase program authorized in 2021 (2021 Authorization). During the year ended December 31, 2023, we repurchased and canceled approximately $669 million of ordinary shares, completing the 2021 Authorization and initiating repurchases under the 2022 Authorization of approximately $469 million of our ordinary shares, leaving $2.5 billion remaining under the 2022 Authorization. Additionally, through January 31, 2024, we repurchased approximately $81 million of our ordinary shares under the 2022 Authorization.

We expect to pay a competitive and growing dividend. Since the launch of Trane Technologies in March 2020, we have increased our quarterly share dividend by 42%, from $0.53 to $0.75 per ordinary share, or $2.12 to $3.00 per share annualized. All four 2023 quarterly dividends were paid during the year ended December 31, 2023. In February 2024, our Board of Directors declared an increase in our quarterly share dividend by 12%, from $0.75 to $0.84 per ordinary share, or $3.00 to $3.36 per share annualized starting in the first quarter of 2024.

We continue to actively manage and strengthen our business portfolio to meet the current and future needs of our customers. We achieve this partly through engaging in research and development and sustaining activities and partly through acquisitions. Sustaining activities include costs incurred to reduce production costs, improve existing products, create custom solutions for customers and provide support to our manufacturing facilities. Our research and development and sustaining costs account for approximately two percent of annual *Net revenues.* Each year, we make investments in new product development and new technology innovation as they are key factors in achieving our strategic objectives as a leader in the climate sector. In addition, we make investments in technology and business for our operational sustainability programs.

In pursuing our business strategy, we routinely conduct discussions, evaluate targets and enter into agreements regarding possible acquisitions, divestitures, joint ventures and equity investments. Since 2020, we acquired several businesses, entered into joint ventures and invested in companies that complement existing products and services further enhancing our product portfolio. During the years ended December 31, 2023 and December 31, 2022, we deployed capital of approximately $881 million and $256 million, respectively, attributable to acquisitions and equity investments.

We incur costs associated with restructuring initiatives intended to result in improved operating performance, profitability and working capital levels. Actions associated with these initiatives may include workforce reductions, improving manufacturing productivity, realignment of management structures and rationalizing certain assets. Post separation, we have exceeded our goal of $300 million in total annual savings under our transformation initiatives through December 31, 2023. In order to achieve these cost savings, we incurred approximately $134 million of costs cumulatively through December 31, 2023. We believe that our existing cash flow, committed credit lines and access to the capital markets will be sufficient to fund share repurchases, dividends, research and development, sustaining activities, business portfolio changes and ongoing restructuring actions.

Certain of our subsidiaries entered into Funding Agreements with Aldrich and Murray pursuant to which those subsidiaries are obligated, among other things, to pay the costs and expenses of Aldrich and Murray during the pendency of the Chapter 11 cases to the extent distributions from their respective subsidiaries are insufficient to do so and to provide an amount for the funding for a trust established pursuant to section 524(g) of the Bankruptcy Code, to the extent that the other assets of Aldrich and Murray are insufficient to provide the requisite trust funding. During the third quarter of 2021, Aldrich and Murray filed a motion with the Bankruptcy Court to create a $270.0 million QSF. The funds held in the QSF would be available to provide funding for the Section 524(g) Trust upon effectiveness of the Plan. On January 27, 2022, the Bankruptcy Court granted the request to fund the QSF, which was funded on March 2, 2022.

Liquidity

The following table contains several key measures of our financial condition and liquidity at the periods ended December 31:

In millions	2023		2022	
Cash and cash equivalents	$ 1,095.3		$ 1,220.5	
Short-term borrowings and current maturities of long-term debt	801.9		1,048.0	
Long-term debt	3,977.9		3,788.3	
Total debt	4,779.8		4,836.3	
Total Trane Technologies plc shareholders' equity	6,995.2		6,088.6	
Total equity	7,017.0		6,105.2	
Debt-to-total capital ratio	40.5	%	44.2	%

Debt and Credit Facilities

As of December 31, 2023, our short-term obligations primarily consist of current maturities of $499.4 million of long-term debt that matures in November 2024 and $295.0 million of fixed rate debentures that contain a put feature that the holders may exercise on each anniversary of the issuance date. If exercised, we are obligated to repay in whole or in part, at the holder's option, the outstanding principal amount (plus accrued and unpaid interest) of the debentures held by the holder. In November 2023, we paid $45.8 million of principal to holders who elected to exercise their put options. Holders who had the option to exercise puts up to $37.2 million for settlement in February 2024 did not exercise such option. Holders will have the option to exercise puts up to $257.8 million for settlement in November 2024. We also maintain a commercial paper program which is used for general corporate purposes. Under the program, the maximum aggregate amount of unsecured commercial paper notes available to be issued, on a private placement basis, is $2.0 billion as of December 31, 2023. We had no commercial paper outstanding at December 31, 2023 and December 31, 2022. See Note 7, "Debt and Credit Facilities", to the Consolidated Financial Statements for additional information regarding the terms of our short-term obligations.

Our long-term obligations primarily consist of long-term debt with final maturity dates ranging between 2025 and 2049. In addition, we maintain two $1.0 billion senior unsecured revolving credit facilities, one of which matures in June 2026 and the other which matures in April 2027. The facilities provide support for our commercial paper program and can be used for working capital and other general corporate purposes. Total commitments of $2.0 billion were unused at December 31, 2023 and December 31, 2022. See Note 7, "Debt and Credit Facilities", to the Consolidated Financial Statements and further below in *Supplemental Guarantor Financial Information* for additional information regarding the terms of our long-term obligations and their related guarantees.

Cash Flows

The following table reflects the major categories of cash flows for the years ended December 31, respectively. For additional details, please see the Consolidated Statements of Cash Flows in the Consolidated Financial Statements.

In millions	2023	2022
Net cash provided by continuing operating activities	$ 2,426.8	$ 1,698.7
Net cash used in continuing investing activities	(1,172.2)	(539.8)
Net cash used in continuing financing activities	(1,350.3)	(1,852.2)

Operating Activities

Net cash provided by continuing operating activities for the year ended December 31, 2023 was $2,426.8 million, of which net income provided $2,499.6 million after adjusting for non-cash transactions. Net cash provided by continuing operating activities for the year ended December 31, 2022 was $1,698.7 million, of which net income provided $2,248.8 million after adjusting for non-cash transactions. The year-over-year increase in net cash from continuing operating activities was primarily due to higher net earnings and improved cash conversion cycle. Additionally, during the year ended December 31, 2022, we funded the continuing operations component of the QSF for $91.8 million and made a compensation related payment to a retired executive.

Investing Activities

Cash flows from investing activities represents inflows and outflows regarding the purchase and sale of assets. Primary activities associated with these items include capital expenditures, proceeds from the sale of property, plant and equipment, acquisitions, investments in joint ventures and divestitures. During the year ended December 31, 2023, net cash used in investing activities from continuing operations was $1,172.2 million. The primary drivers of the usage was attributable to acquisition of businesses, which totaled $862.8 million, net of cash acquired, and capital expenditures of $300.7 million. During the year ended December 31, 2022, net cash used in investing activities from continuing operations was $539.8 million. The primary drivers of the usage was attributable to capital expenditures of $291.8 million and acquisition of businesses, which totaled $234.7 million, net of cash acquired.

Financing Activities

Cash flows from financing activities represent inflows and outflows that account for external activities affecting equity and debt. Primary activities associated with these actions include paying dividends to shareholders, repurchasing our own shares, issuing our stock and debt transactions. During the year ended December 31, 2023, net cash used in financing activities from continuing operations was $1,350.3 million. The primary drivers of the outflow related to dividends paid to ordinary shareholders of $683.7 million and the repurchase of $669.3 million in ordinary shares. In addition, we received $699.1 million in proceeds from the issuance of 5.250% senior notes due March 2033 which was offset by the redemption of $700.0 million of senior notes due June 2023. During the year ended December 31, 2022, net cash used in financing activities from continuing operations was $1,852.2 million. The primary drivers of the outflow related to the repurchase of $1,200.2 million in ordinary shares and dividends paid to ordinary shareholders of $620.2 million.

Free Cash Flow

Free cash flow is a non-GAAP measure and defined as *Net cash provided by (used in) continuing operating activities* adjusted for capital expenditures, cash payments for restructuring, transformation costs, merger and acquisition (M&A) related costs, the continuing operations component of the QSF funding and payout of executive compensation less insurance settlements on property claims. This measure is useful to management and investors because it is consistent with management's assessment of our operating cash flow performance. The most comparable GAAP measure to free cash flow is *Net cash provided by (used in) continuing operating activities*. Free cash flow may not be comparable to similarly-titled measures used by other companies and should not be considered a substitute for *Net cash provided by (used in) continuing operating activities* in accordance with GAAP.

A reconciliation of *Net cash provided by (used in) continuing operating activities* to free cash flow the years ended December 31 is as follows:

In millions	2023	2022
Net cash provided by (used in) continuing operating activities	$ 2,426.8	$ 1,698.7
Capital expenditures	(300.7)	(291.8)
Cash payments for restructuring	12.3	17.9
Transformation costs paid	3.9	9.6
Acquisition related transaction costs	18.9	—
QSF funding (continuing operations component)	—	91.8
Compensation related payment to a retired executive	—	64.3
Insurance settlements on property claims	(10.0)	(25.0)
Free cash flow [1]	$ 2,151.2	$ 1,565.5

[1] Represents a non-GAAP measure.

Pension Plans

Our investment objective in managing defined benefit plan assets is to ensure that all present and future benefit obligations are met as they come due. We seek to achieve this goal while trying to mitigate volatility in plan funded status, contribution and expense by better matching the characteristics of the plan assets to that of the plan liabilities. Our approach to asset allocation is to increase fixed income assets as the plan's funded status improves. We monitor plan funded status and asset allocation regularly in addition to investment manager performance. In addition, we monitor the impact of market conditions on our defined benefit plans on a regular basis. None of our defined benefit pension plans have experienced a significant impact on their liquidity due to market volatility. See Note 11, "Pension and Postretirement Benefits Other Than Pensions", to the Consolidated Financial Statements for additional information regarding pensions.

Capital Resources

Based on historical performance and current expectations, we believe our cash and cash equivalents balance, the cash generated from our operations, our committed credit lines and our expected ability to access capital markets, including our commercial paper program, will satisfy our working capital needs, capital expenditures, dividends, share repurchases, upcoming debt maturities, and other liquidity requirements associated with our operations for the foreseeable future.

Capital expenditures were $300.7 million, $291.8 million and $223.0 million for the years ended December 31, 2023, 2022 and 2021, respectively. Our investments continue to improve manufacturing productivity, reduce costs, provide environmental enhancements, upgrade information technology infrastructure and security and advanced technologies for existing facilities. The capital expenditure program for 2024 is estimated to be approximately 2.5% of revenues, including amounts approved in prior periods. Many of these projects are subject to review and cancellation at our option without incurring substantial charges.

For financial market risk impacting the Company, see Part II, Item 7A, "Quantitative and Qualitative Disclosure About Market Risk."

Capitalization

Financing rates and conditions associated with future borrowings under our commercial paper program or term debt offerings will be affected by general financing conditions and our credit ratings. On April 4, 2023, Moody's announced that it upgraded our long-term credit rating from Baa2 to Baa1 and put the Company on positive outlook. On August 18, 2023, Standard and Poor's announced that it upgraded our long-term credit rating from BBB to BBB+. As of December 31, 2023, our credit ratings were as follows:

	Short-term	Long-term
Moody’s	P-2	Baa1
Standard and Poor’s	A-2	BBB+

The credit ratings set forth above are not a recommendation to buy, sell or hold securities and may be subject to revision or withdrawal by the assigning rating organization. Each rating should be evaluated independently of any other rating.

Our public debt does not contain financial covenants and our revolving credit lines have a debt-to-total capital covenant of 65%. As of December 31, 2023, our debt-to-total capital ratio was significantly beneath this limit.

Contractual Obligations

Our contractual cash obligations include required payments of long-term debt principal and interest, purchase obligations and expected obligations under our pension and postretirement benefit plans. In addition, we have required payments of operating leases, income taxes and expected obligations under the Funding agreement, environmental and product liability matters. For additional information regarding leases, income taxes, including unrecognized tax benefits, and contingent liabilities, see Note 10 "Leases", Note 16 "Income Taxes" and Note 20 "Commitments and Contingencies", respectively, to the Consolidated Financial Statements. Our material cash requirements include the following contractual and other obligations.

Debt

At December 31, 2023, we had outstanding aggregate long-term debt principal payments of $4,809.8 million, with $802.5 million payable within 12 months. The amount payable within 12 months includes $295.0 million of debt redeemable at the option of the holder. The scheduled maturities of these bonds range between 2027 and 2028. Future interest payments on long-term debt total $2,324.5 million, with $218.2 million payable within 12 months. See Note 7, "Debt and Credit Facilities", to the Consolidated Financial Statements for additional information regarding debt.

Purchase Obligations

Purchase obligations include commitments under legally enforceable contracts or purchase orders. At December 31, 2023, we had purchase obligations of $1,096.1 million, which are primarily payable within 12 months.

Pensions

It is our objective to contribute to the pension plans to ensure adequate funds are available in the plans to make benefit payments to plan participants and beneficiaries when required. We currently expect that we will contribute approximately $61 million to our enterprise plans worldwide in 2024. The timing and amounts of future contributions are dependent upon the funding status of the plan, which is expected to vary as a result of changes in interest rates, returns on underlying assets, and other factors. See Note 11, "Pensions and Postretirement Benefits Other Than Pensions", to the Consolidated Financial Statements for additional information regarding pensions.

Postretirement Benefits Other than Pensions

We fund postretirement benefit costs principally on a pay-as-you-go basis as medical costs are incurred by covered retiree populations. Benefit payments, which are net of expected plan participant contributions and Medicare Part D subsidy, are expected to be approximately $30 million in 2024. See Note 11, "Pensions and Postretirement Benefits Other Than Pensions", to the Consolidated Financial Statements for additional information regarding postretirement benefits other than pensions.

Supplemental Guarantor Financial Information

Trane Technologies plc (Plc or Parent Company) and certain of its 100% directly or indirectly owned subsidiaries provide guarantees of public debt issued by other 100% directly or indirectly owned subsidiaries of Plc. The following table shows our guarantor relationships as of December 31, 2023:

Parent, issuer or guarantors	Notes issued	Notes guaranteed
Trane Technologies plc (Plc)	None	All registered notes and debentures
Trane Technologies Irish Holdings Unlimited Company (TT Holdings)	None	All notes issued by TTFL and TTC HoldCo
Trane Technologies Lux International Holding Company S.à.r.l. (TT International) [(1)]	None	All notes issued by TTFL and TTC HoldCo
Trane Technologies Global Holding II Company (TT Global II) [(2)]	None	All notes issued by TTFL and TTC HoldCo
Trane Technologies Americas Holding Corporation (TT Americas) [(3)]	None	All notes issued by TTFL and TTC HoldCo
Trane Technologies Financing Limited (TTFL)	3.550% Senior notes due 2024 3.500% Senior notes due 2026 3.800% Senior notes due 2029 5.250% Senior notes due 2033 4.650% Senior notes due 2044 4.500% Senior notes due 2049	All notes and debentures issued by TTC HoldCo and TTC
Trane Technologies HoldCo Inc. (TTC HoldCo)	3.750% Senior notes due 2028 5.750% Senior notes due 2043 4.300% Senior notes due 2048	All notes issued by TTFL
Trane Technologies Company LLC (TTC)	7.200% Debentures due 2023-2025 6.480% Debentures due 2025 Puttable debentures due 2027-2028	All notes issued by TTFL and TTC HoldCo

[(1)] On November 20, 2023, Trane Technologies Global Holding Company Limited (TT Global) merged into TT International, an Irish private limited company.

[(2)] Entity is a newly formed Delaware Corporation and was formed on November 3, 2023.

[(3)] TT Americas, formally known as Trane Grid Services LLC, was renamed and redomiciled as a Delaware Corporation.

Each subsidiary debt issuer and guarantor is owned 100% directly or indirectly by the Parent Company. Each guarantee is full and unconditional, and provided on a joint and several basis. There are no significant restrictions of the Parent Company, or any guarantor, to obtain funds from its subsidiaries, such as provisions in debt agreements that prohibit dividend payments, loans or advances to the parent by a subsidiary. The following tables present summarized financial information for the Parent Company and subsidiary debt issuers and guarantors on a combined basis (together, "obligor group") after elimination of intercompany transactions and balances based on the Company’s legal entity ownerships and guarantees outstanding at December 31, 2023. Our obligor groups as of December 31, 2023 were as follows: Obligor group 1 consists of Plc, TT Holdings, TT International, TT Global II, TT Americas, TTFL, TTC HoldCo and TTC; Obligor group 2 consists of Plc, TTFL and TTC.

Summarized Statements of Earnings

	Year ended December 31, 2023	
In millions	**Obligor group 1**	**Obligor group 2**
Net revenues	$ —	$ —
Gross profit (loss)	—	—
Intercompany interest and fees	63.4	386.9
Earnings (loss) from continuing operations	(164.0)	207.8
Discontinued operations, net of tax	(20.6)	(25.5)
Net earnings (loss)	(184.6)	182.3
Less: Net earnings attributable to noncontrolling interests	—	—
Net earnings (loss) attributable to Trane Technologies plc	$ (184.6)	$ 182.3

Summarized Balance Sheet

	December 31, 2023	
In millions	**Obligor group 1**	**Obligor group 2**
ASSETS		
Intercompany receivables	$ 1,517.3	$ 3,302.6
Current assets	1,609.1	3,378.3
Intercompany notes receivable	1,837.1	7,687.1
Noncurrent assets	2,522.3	8,263.6
LIABILITIES		
Intercompany payables	4,693.4	1,611.6
Current liabilities	5,979.0	2,856.4
Intercompany notes payable	4,000.0	4,000.0
Noncurrent liabilities	8,561.8	7,201.0

Critical Accounting Estimates

Management's Discussion and Analysis of Financial Condition and Results of Operations are based upon our Consolidated Financial Statements, which have been prepared in accordance with U.S. GAAP. The preparation of financial statements in conformity with those accounting principles requires management to use judgment in making estimates and assumptions based on the relevant information available at the end of each period. These estimates and assumptions have a significant effect on reported amounts of assets and liabilities, revenue and expenses as well as the disclosure of contingent assets and liabilities because they result primarily from the need to make estimates and assumptions on matters that are inherently uncertain. Actual results may differ from these estimates. If updated information or actual amounts are different from previous estimates, the revisions are included in our results for the period in which they become known.

The following is a summary of certain accounting estimates and assumptions made by management that we consider critical.

- Goodwill and indefinite-lived intangible assets – We have significant goodwill and indefinite-lived intangible assets on our balance sheet related to acquisitions. These assets are tested and reviewed annually during the fourth quarter for impairment or when there is a significant change in events or circumstances that indicate that the fair value of an asset is more likely than not less than the carrying amount of the asset. In addition, an interim impairment test is completed upon a triggering event or when there is a reorganization of reporting structure or disposal of all or a portion of a reporting unit.

  The determination of estimated fair value requires us to make assumptions about estimated cash flows, including profit margins, long-term forecasts, discount rates and terminal growth rates. We developed these assumptions based on the market and geographic risks unique to each reporting unit. The estimates of fair value are based on the best information available as of the date of the assessment, which primarily incorporates management assumptions about expected future cash flows.

Annual Goodwill Impairment Test

Impairment of goodwill is tested at the reporting unit level. The test compares the carrying amount of the reporting unit to its estimated fair value. If the estimated fair value of a reporting unit exceeds its carrying amount, goodwill of the reporting unit is not impaired. To the extent that the carrying value of the reporting unit exceeds its estimated fair value, an impairment loss would be recognized for the amount by which the reporting unit's carrying amount exceeds its fair value, not to exceed the carrying amount of goodwill in that reporting unit.

As quoted market prices are not available for our reporting units, the calculation of their estimated fair value is determined using three valuation techniques: a discounted cash flow model (an income approach), a market-adjusted multiple of earnings and revenues (a market approach), and a similar transactions method (also a market approach). The discounted cash flow approach relies on our estimates of future cash flows and explicitly addresses factors such as timing, growth and margins, with due consideration given to forecasting risk. The multiple of earnings and revenues approach reflects the market's expectations for future growth and risk, with adjustments to account for differences between the guideline publicly traded companies and the subject reporting units. The similar transactions method considers prices paid in transactions that have recently occurred in our industry or in related industries. These valuation techniques are weighted 50%, 40% and 10%, respectively.

Under the income approach, we assumed a forecasted cash flow period of five years with discount rates ranging from 10.0% to 12.5% and a terminal growth rate of 3.0%. Under the guideline public company method, we used an adjusted multiple ranging from 10.0 to 17.0 of projected earnings before interest, taxes, depreciation and amortization (EBITDA) based on the market information of comparable companies. Additionally, we compared the estimated aggregate fair value of our reporting units to our overall market capitalization. For all reporting units, the excess of the estimated fair value over carrying value (expressed as a percentage of carrying value) exceeded 250%. A significant increase in the discount rate, decrease in the long-term growth rate, or substantial reductions in our end markets and volume assumptions could have a negative impact on the estimated fair value of these reporting units.

Other Indefinite-lived intangible assets

Other intangible assets with indefinite useful lives are tested for impairment on an annual basis. The fair value of intangible assets with indefinite useful lives is determined on a relief from royalty methodology (income approach) which is based on the implied royalty paid, at an appropriate discount rate, to license the use of an asset rather than owning the asset. The present value of the after-tax cost savings (i.e., royalty relief) indicates the estimated fair value of the asset. Any excess of the carrying value over the estimated fair value would be recognized as an impairment loss equal to that excess.

In testing our other indefinite-lived intangible assets for impairment, we assumed forecasted revenues for a period of five years with discount rates ranging from 10.0% to 15.0%, terminal growth rates of 3.0%, and royalty rates ranging from 0.5% to 4.5%. For all indefinite-lived intangible assets, the excess of the estimated fair value over carrying value (expressed as a percentage of carrying value) exceeded 35%. A significant increase in the discount rate, decrease in the long-term growth rate, decrease in the royalty rate or substantial reductions in our end markets and volume assumptions could have a negative impact on the estimated fair values of any of our tradenames.

- Business combinations - Acquisitions that meet the definition of a business combination are recorded using the acquisition method of accounting. We include the operating results of acquired entities from their respective dates of acquisition. We recognize and measure the identifiable assets acquired, liabilities assumed, including contingent consideration relating to potential earnout provisions and any non-controlling interest as of the acquisition date fair value. The valuation of intangible assets is determined using an income approach methodology. We use assumptions to value the intangible assets including projected cash flows, including revenue growth rates and margins, customer attrition rates, royalty rates, tax rates and discount rates. The excess, if any, of total consideration transferred in a business combination over the fair value of identifiable assets acquired, liabilities assumed, and any non-controlling interest is recognized as goodwill. Costs incurred as a result of a business combination other than costs related to the issuance of debt or equity securities are recorded in the period the costs are incurred.

Contingent consideration

We assess any contingent consideration included in the consideration paid of a business combination. The value recorded is based on estimates of future financial projections on revenue under various potential scenarios, in which a Monte Carlo simulation model runs many iterations based on comparable companies' revenue growth rates and their implied revenue volatilities. These cash flow projections are discounted with a risk adjusted rate. Each quarter until such contingent amounts are earned, the fair value of the liability is remeasured at each reporting period and adjusted as a component of operating expenses based on changes to the underlying assumptions. The estimates used to determine the fair value of the contingent consideration liability are subject to significant judgment, specifically revenue growth rates, implied revenue volatilities and discount rates.

- Asbestos matters – Prior to the Petition Date, certain of our wholly-owned subsidiaries and former companies were named as defendants in asbestos-related lawsuits in state and federal courts. We recorded a liability for our actual and anticipated future claims as well as an asset for anticipated insurance settlements. We performed a detailed analysis and projected an estimated range of the total liability for pending and unasserted future asbestos-related claims. We recorded the liability at the low end of the range as we believed that no amount within the range is a better estimate than any other amount. Our key assumptions underlying the estimated asbestos-related liabilities included the number of people occupationally exposed and likely to develop asbestos-related diseases such as mesothelioma and lung cancer, the number of people likely to file an asbestos-related personal injury claim against us, the average settlement and resolution of each claim and the percentage of claims resolved with no payment. Asbestos-related defense costs were excluded from the asbestos claims liability and were recorded separately as services were incurred. None of our existing or previously-owned businesses were a producer or manufacturer of asbestos. We recorded certain income and expenses associated with our asbestos liabilities and corresponding insurance recoveries within *Discontinued operations, net of tax*, as they related to previously divested businesses, except for amounts associated with asbestos liabilities and corresponding insurance recoveries of Murray and its predecessors, which were recorded within continuing operations.

- Revenue recognition – Revenue is recognized when control of a good or service promised in a contract (i.e., performance obligation) is transferred to a customer. Control is obtained when a customer has the ability to direct the use of and obtain substantially all of the remaining benefits from that good or service. A majority of our revenues are recognized at a point-in-time as control is transferred at a distinct point in time per the terms of a contract. However, a portion of our revenues are recognized over time as the customer simultaneously receives control as we perform work under a contract. For these arrangements, the cost-to-cost input method is used as it best depicts the transfer of control to the customer that occurs as we incur costs.

  The transaction price allocated to performance obligations reflects our expectations about the consideration we will be entitled to receive from a customer. To determine the transaction price, variable and non-cash consideration are assessed as well as whether a significant financing component exists. We include variable consideration in the estimated transaction price when it is probable that significant reversal of revenue recognized would not occur when the uncertainty associated with variable consideration is subsequently resolved. We consider historical data in determining our best estimates of variable consideration, and the related accruals are recorded using the expected value method.

  We enter into sales arrangements that contain multiple goods and services. For these arrangements, each good or service is evaluated to determine whether it represents a distinct performance obligation and whether the sales price for each obligation is representative of standalone selling price. If available, we utilize observable prices for goods or services sold separately to similar customers in similar circumstances to evaluate relative standalone selling price. List prices are used if they are determined to be representative of standalone selling prices. Where necessary, we ensure that the total transaction price is then allocated to the distinct performance obligations based on the determination of their relative standalone selling price at the inception of the arrangement.

  We recognize revenue for delivered goods or services when the delivered good or service is distinct, control of the good or service has transferred to the customer, and only customary refund or return rights related to the goods or services exist. For extended warranties and long-term service agreements, revenue for these distinct performance obligations are recognized over time on a straight-line basis over the respective contract term.

- Income taxes – Deferred tax assets and liabilities are determined based on temporary differences between 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. We recognize future tax benefits, such as net operating losses and tax credits, to the extent that realizing these benefits is considered in our judgment to be more likely than not. We regularly review the recoverability of our deferred tax assets considering our historic profitability, projected future taxable income, timing of the reversals of existing temporary differences and the feasibility of our tax planning strategies. Where appropriate, we record a valuation allowance with respect to a future tax benefit.

  The provision for income taxes involves a significant amount of management judgment regarding interpretation of relevant facts and laws in the jurisdictions in which we operate. Future changes in applicable laws, projected levels of taxable income, and tax planning could change the effective tax rate and tax balances recorded by us. In addition, tax authorities periodically review income tax returns filed by us and can raise issues regarding our filing positions, timing and amount of income or deductions, and the allocation of income among the jurisdictions in which we operate. A significant period of time may elapse between the filing of an income tax return and the ultimate resolution of an issue raised by a revenue authority with respect to that return. We believe that we have adequately provided for any reasonably foreseeable resolution of these matters. We will adjust our estimate if significant events so dictate. To the extent that the ultimate results differ from our original or adjusted estimates, the effect will be recorded in the provision for income taxes in the period that the matter is finally resolved.

- Employee benefit plans – We provide a range of benefits to eligible employees and retirees, including pensions, postretirement and postemployment benefits. Determining the cost associated with such benefits is dependent on various actuarial assumptions including discount rates, expected return on plan assets, compensation increases, mortality, turnover rates and healthcare cost trend rates. Actuarial valuations are performed to determine expense in accordance with GAAP. Actual results may differ from the actuarial assumptions and are generally accumulated and amortized into earnings over future periods. We review our actuarial assumptions at each measurement date and make modifications to the assumptions based on current rates and trends, if appropriate. The discount rate, the rate of compensation increase and the expected long-term rates of return on plan assets are determined as of each measurement date. We believe that the assumptions utilized in recording our obligations under our plans are reasonable based on input from our actuaries, outside investment advisors and information as to assumptions used by plan sponsors.

  Changes in any of the assumptions can have an impact on the net periodic pension cost or postretirement benefit cost. Estimated sensitivities to the expected 2023 net periodic pension cost of a 0.25% rate decline in the two basic assumptions are as follows: the decline in the discount rate would increase expense by $0.5 million and the decline in the estimated return on assets would increase expense by $5.2 million. A 0.25% rate decrease in the discount rate for postretirement benefits would increase expected 2023 net periodic postretirement benefit cost by $0.3 million.

Recent Accounting Pronouncements

See Note 2, "Summary of Significant Accounting Policies" to the Consolidated Financial Statements for a discussion of recent accounting pronouncements.

Item 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURE ABOUT MARKET RISK

We are exposed to fluctuations in currency exchange rates, interest rates and commodity prices which could impact our results of operations and financial condition.

Foreign Currency Exposures

We have operations throughout the world that manufacture and sell products in various international markets. As a result, we are exposed to movements in exchange rates of various currencies against the U.S. dollar as well as against other currencies throughout the world.

Many of our non-U.S. operations have a functional currency other than the U.S. dollar, and their results are translated into U.S. dollars for reporting purposes. Therefore, our reported results will be higher or lower depending on the weakening or strengthening of the U.S. dollar against the respective foreign currency. Our largest concentration of revenues from non-U.S. operations as of December 31, 2023 are in Euros and Chinese Yuan. A hypothetical 10% unfavorable change in the average exchange rate used to translate *Net revenues* for the year ended December 31, 2023 from either Euros or Chinese Yuan-based operations into U.S. dollars would result in a decline of approximately $165 million and $70 million, respectively.

We use derivative instruments to partially hedge those material exposures that cannot be naturally offset. The instruments utilized are viewed as risk management tools, primarily involve little complexity and are not used for trading or speculative purposes. To minimize the risk of counterparty non-performance, derivative instrument agreements are made only through major financial institutions with significant experience in such derivative instruments.

We evaluate our exposure to changes in currency exchange rates on our foreign currency derivatives using a sensitivity analysis. The sensitivity analysis is a measurement of the potential loss in fair value based on a percentage change in exchange rates. Based on the currency derivative instruments in place at December 31, 2023, a hypothetical change in fair value of those derivative instruments assuming a 10% adverse change in exchange rates would result in an unrealized loss of $6.5 million, as compared with $7.5 million at December 31, 2022. These amounts, when realized, would be offset by changes in the fair value of the underlying transactions.

Commodity Price Exposures

We are exposed to volatility in the prices of commodities used in some of our products and we use commodity hedge contracts in the financial derivatives market and fixed price purchase contracts to manage this exposure. Commodity risks are systematically managed pursuant to policy guidelines. As a cash flow hedge, gains and losses resulting from the hedging instruments mitigate a portion of our exposures to changes in commodity prices. The maturities of the commodity hedge contracts coincide with the expected purchase of the commodities. Based on the commodity derivative instruments in place at December 31, 2023, a hypothetical change in fair value of those derivative instruments assuming a 10% decrease in commodity prices would result in an unrealized loss of $8.2 million, as compared with $9.0 million at December 31, 2022. These amounts, when realized, would be offset by changes in the fair value of the underlying commodity purchases.

Interest Rate Exposure

Our debt portfolio mainly consists of fixed-rate instruments, and therefore any fluctuation in market interest rates is not expected to have a material effect on our results of operations.

Item 8. FINANCIAL STATEMENTS

(a) The following Consolidated Financial Statements and the report thereon of PricewaterhouseCoopers LLP dated February 8, 2024, are presented in this Annual Report on Form 10-K beginning on page F-1.

Consolidated Financial Statements:

- Report of Independent Registered Public Accounting Firm
- Consolidated Statements of Earnings for the years ended December 31, 2023, 2022 and 2021
- Consolidated Statements of Comprehensive Income for the years ended December 31, 2023, 2022 and 2021
- Consolidated Balance Sheets at December 31, 2023 and 2022
- Consolidated Statements of Equity for the years ended December 31, 2023, 2022 and 2021
- Consolidated Statements of Cash Flows for the years ended December 31, 2023, 2022 and 2021
- Notes to Consolidated Financial Statements

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

None.

Item 9A. CONTROLS AND PROCEDURES

(a) Evaluation of Disclosure Controls and Procedures

The Company's management, including its Chief Executive Officer and Chief Financial Officer, have conducted an evaluation of the effectiveness of the Company's disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the Exchange Act)), as of the end of the period covered by this Annual Report on Form 10-K. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded as of December 31, 2023, that the Company's disclosure controls and procedures were effective in ensuring that information required to be disclosed by the Company in reports that it files or submits under the Exchange Act has been recorded, processed, summarized and reported, within the time periods specified in the Commission's rules and forms, and that such information has been accumulated and communicated to the Company's management including its Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

(b) Management's Report on Internal Control Over Financial Reporting

The Company's management is responsible for establishing and maintaining adequate internal control over financial reporting as such term is defined under Exchange Act Rules 13a-15(f) and 15d-15(f). Internal control over financial reporting is a process designed by, or under the supervision of, the Chief Executive Officer and Chief Financial Officer and effected by the Company's Board of Directors 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.

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

Management has assessed the effectiveness of internal control over financial reporting as of December 31, 2023. In making its assessment, management has utilized the criteria set forth by the Committee of Sponsoring Organizations (COSO) of the Treadway Commission in Internal Control - Integrated Framework (2013). Management concluded that based on its assessment, the Company's internal control over financial reporting was effective as of December 31, 2023.

The effectiveness of the Company's internal control over financial reporting as of December 31, 2023 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

(c) Changes in Internal Control Over Financial Reporting

There were no changes in internal control over financial reporting (as defined by Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that occurred during the quarter ended December 31, 2023 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Item 9B. OTHER INFORMATION

None.

Item 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not Applicable.

PART III

Item 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information regarding our executive officers is included in Part I under the caption "Executive Officers of Registrant."

The other information required by this item is incorporated herein by reference to the information contained under the headings "Item 1. Election of Directors", "Delinquent Section 16(a) Reports" and "Corporate Governance" in our definitive proxy statement for the 2024 annual general meeting of shareholders (2024 Proxy Statement).

Item 11. EXECUTIVE COMPENSATION

The other information required by this item is incorporated herein by reference to the information contained under the headings "Compensation Discussion and Analysis," "Compensation of Directors," "Executive Compensation," "Human Resources and Compensation Committee Report" and "Human Resources and Compensation Committee Interlocks and Insider Participation" in our 2024 Proxy Statement.

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

The other information required by this item is incorporated herein by reference to the information contained under the headings "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plan Information" in our 2024 Proxy Statement.

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

The other information required by this item is incorporated herein by reference to the information contained under the headings "Corporate Governance" and "Certain Relationships and Related Person Transactions" in our 2024 Proxy Statement.

Item 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this item is incorporated herein by reference to the information contained under the caption "Fees of the Independent Auditors" in our 2024 Proxy Statement.

PART IV

Item 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) 1.	Financial Statements See Item 8.
2.	Financial Statement Schedules
	Schedules have been omitted because the required information is not applicable or because the required information is included elsewhere in this Annual Report on Form 10-K.
3.	Exhibits
	The exhibits listed on the accompanying index to exhibits are filed as part of this Annual Report on Form 10-K.

TRANE TECHNOLOGIES PLC
INDEX TO EXHIBITS
(Item 15(a))

Description

Pursuant to the rules and regulations of the Securities and Exchange Commission ("SEC"), Trane Technologies plc (the "Company") has filed certain agreements as exhibits to this Annual Report on Form 10-K. These agreements may contain representations and warranties by the parties. These representations and warranties have been made solely for the benefit of the other party or parties to such agreements and (i) may have been qualified by disclosures made to such other party or parties, (ii) were made only as of the date of such agreements or such other date(s) as may be specified in such agreements and are subject to more recent developments, which may not be fully reflected in our public disclosure, (iii) may reflect the allocation of risk among the parties to such agreements and (iv) may apply materiality standards different from what may be viewed as material to investors. Accordingly, these representations and warranties may not describe our actual state of affairs at the date hereof and should not be relied upon.

On July 1, 2009, Ingersoll-Rand Company Limited, a Bermuda company, completed a reorganization to change the jurisdiction of incorporation of the parent company from Bermuda to Ireland. As a result, Ingersoll-Rand plc replaced Ingersoll-Rand Company Limited as the ultimate parent company effective July 1, 2009. All references related to the Company prior to July 1, 2009 relate to Ingersoll-Rand Company Limited. On March 2, 2020, Ingersoll-Rand plc changed its name to Trane Technologies plc.

(a) Exhibits

Exhibit No.	Description	Method of Filing
1.1	Underwriting Agreement, dated as of February 16, 2023, by and among Trane Technologies Financing Limited, as issuer, Trane Technologies plc, Trane Technologies Global Holding Company Limited, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC and Trane Technologies HoldCo Inc., as guarantors, and BofA Securities, Inc., Goldman Sachs & Co. LLC and J.P. Morgan Securities LLC, as representatives of the several underwriters.	Incorporated by reference to Exhibit 1.1 to the Company's 2023 Form 8-K (File No. 001-34400) filed with the SEC on March 3, 2023.
2.1	Agreement and Plan of Merger, dated as of April 30, 2019, by and among the Company, Gardner Denver Holdings, Inc., Ingersoll-Rand U.S. HoldCo, Inc. and Charm Merger Sub Inc.	Incorporated by reference to Exhibit 2.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on May 6, 2019.
2.2	Separation and Distribution Agreement, dated as of April 30, 2019, by and between Ingersoll-Rand plc and Ingersoll-Rand U.S. HoldCo, Inc.	Incorporated by reference to Exhibit 2.2 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on May 6, 2019).
3.1	Constitution of the Company, as amended and restated on June 2, 2016	Incorporated by reference to Exhibit 3.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on June 7, 2016.
3.2	Amendment to the Constitution of the Company dated March 2, 2020	Incorporated by reference to Exhibit 3.2 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
	The Company and its subsidiaries are parties to several long-term debt instruments under which, in each case, the total amount of securities authorized does not exceed 10% of the total assets of the Company and its subsidiaries on a consolidated basis.	Pursuant to paragraph 4 (iii)(A) of Item 601 (b) of Regulation S-K, the Company agrees to furnish a copy of such instruments to the Securities and Exchange Commission upon request.

Exhibit No.	Description	Method of Filing
4.1	Indenture, dated as of June 20, 2013, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Company Limited and Ingersoll-Rand International Holding Limited, as guarantors and The Bank of New York Mellon, as Trustee.	Incorporated by reference to Exhibit 4.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on June 26, 2013.
4.2	First Supplemental Indenture, dated as of June 20, 2013, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Company Limited and Ingersoll-Rand International Holding Limited, as guarantors and The Bank of New York Mellon, as Trustee, relating to the 2.875% Senior Notes due 2019.	Incorporated by reference to Exhibit 4.2 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on June 26, 2013.
4.3	Second Supplemental Indenture, dated as of June 20, 2013, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Company Limited and Ingersoll-Rand International Holding Limited, as guarantors and The Bank of New York Mellon, as Trustee, relating to the 4.250% Senior Notes due 2023.	Incorporated by reference to Exhibit 4.3 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on June 26, 2013.
4.4	Third Supplemental Indenture, dated as of June 20, 2013, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Company Limited and Ingersoll-Rand International Holding Limited, as guarantors and The Bank of New York Mellon, as Trustee, relating to the 5.750% Senior Notes due 2043.	Incorporated by reference to Exhibit 4.4 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on June 26, 2013.
4.5	Fourth Supplemental Indenture, dated as of November 20, 2013, among Ingersoll-Rand Global Holding Company Limited, a Bermuda company, Ingersoll-Rand Company Limited, a Bermuda company, Ingersoll-Rand International Holding Limited, a Bermuda company, Ingersoll-Rand plc, an Irish public limited company, Ingersoll-Rand Company, a New Jersey corporation, and The Bank of New York Mellon, as Trustee, to the Indenture dated as of June 20, 2013.	Incorporated by reference to Exhibit 4.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on November 26, 2013.
4.6	Fifth Supplemental Indenture, dated as of October 28, 2014, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand Company, as co-obligor, Ingersoll-Rand plc, Ingersoll-Rand Company Limited, Ingersoll-Rand International Holding Limited, Ingersoll-Rand Luxembourg Finance S.A., as guarantors, and The Bank of New York Mellon, as Trustee, to an Indenture, dated as of June 20, 2013.	Incorporated by reference to Exhibit 4.5 to the Company’s Form 8-K (File No. 001-34400) filed with the SEC on October 29, 2014.
4.7	Sixth Supplemental Indenture, dated as of December 18, 2015, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand Company, as co-obligor,	Incorporated by reference to Exhibit 4.21 to the Company's Form 10-K for the fiscal year ended 2015 (File No. 001-34400) filed with the SEC on February 12, 2016.

Exhibit No.	Description	Method of Filing
4.8	Seventh Supplemental Indenture, dated as of April 5, 2016, by and among Ingersoll-Rand Global Holding company Limited, as issuer, Ingersoll-Rand Company, as co-obligor, Ingersoll-Rand plc, Ingersoll-Rand International Holding Limited, Ingersoll-Rand Luxembourg Finance S.A., Ingersoll-Rand Lux International Holding Company S.à r.l., and Ingersoll-Rand Irish Holdings Unlimited Company, as guarantors, and The Bank of New York Mellon, as Trustee, to an indenture, dated as of June 20, 2013.	Incorporated by reference to Exhibit 4.19 to the Company's Form 10-K for the fiscal year ended 2016 (File No. 001-34400) filed with the SEC on February 13, 2017.
4.9	Eighth Supplemental Indenture, dated as of May 1, 2020, by and among Ingersoll-Rand Global Holding Company Limited, Ingersoll-Rand Company, Trane Technologies plc, Trane Technologies Luxembourg Finance S.A., Trane Technologies Lux International Holding Company S.à.r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., and The Bank of New York Mellon, as Trustee, to an indenture dated as of June 20, 2013.	Incorporated by reference to Exhibit 4.9 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.10	Ninth Supplemental Indenture, dated as of May 1, 2020, by and among Ingersoll-Rand Global Holding Company Limited, Ingersoll-Rand Company, Trane Technologies plc, Trane Technologies Luxembourg Finance S.A., Trane Technologies Lux International Holding Company S.à.r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., and The Bank of New York Mellon, as Trustee, to an indenture dated as of June 20, 2013.	Incorporated by reference to Exhibit 4.10 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.11	Tenth Supplemental Indenture, dated as of May 1, 2020, by and among Trane Technologies HoldCo Inc., Ingersoll-Rand Global Holding Company Limited, Ingersoll-Rand Company, Trane Technologies plc, Trane Technologies Luxembourg Finance S.A., Trane Technologies Lux International Holding Company S.à.r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC, and The Bank of New York Mellon, as Trustee, to an indenture dated as of June 20, 2013.	Incorporated by reference to Exhibit 4.11 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.12	Eleventh Supplemental Indenture, dated as of May 1, 2020, by and among Trane Technologies HoldCo Inc., Ingersoll-Rand Global Holding Company Limited, Ingersoll-Rand Company, Trane Technologies plc, Trane Technologies Luxembourg Finance S.A., Trane Technologies Lux International Holding Company S.à.r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC, and The Bank of New York Mellon, as Trustee, to an indenture dated as of June 20, 2013.	Incorporated by reference to Exhibit 4.12 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.

Exhibit No.	Description	Method of Filing
4.14	Thirteenth Supplemental Indenture, dated as of November 20, 2023, by and among Trane Technologies HoldCo Inc., Trane Technologies Company LLC, Trane Technologies plc, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company,Trane Technologies Financing Limited, Trane Technologies Americas Holding Corporation, and Trane Technologies Global Holding II Company Limited, and The Bank of New York Mellon, as Trustee.	Filed herewith.
4.15	Indenture, dated as of October 28, 2014, by and among Ingersoll-Rand Luxembourg Finance S.A., as issuer, and Ingersoll-Rand plc, Ingersoll-Rand Company Limited, Ingersoll-Rand International Holding Limited, Ingersoll-Rand Company and Ingersoll-Rand Global Holding Company Limited, as guarantors, and The Bank of New York Mellon, as Trustee.	Incorporated by reference to Exhibit 4.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on October 29, 2014
4.16	First Supplemental Indenture, dated as of October 28, 2014, by and among Ingersoll-Rand Luxembourg Finance S.A., as issuer, and Ingersoll-Rand plc, Ingersoll-Rand Company Limited, Ingersoll-Rand International Holding Limited, Ingersoll-Rand Company and Ingersoll-Rand Global Holding Company Limited, as guarantors, and The Bank of New York Mellon, as Trustee, relating to the 2.625% Senior Notes due 2020.	Incorporated by reference to Exhibit 4.2 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on October 29, 2014.
4.17	Second Supplemental Indenture, dated as of October 28, 2014, by and among Ingersoll-Rand Luxembourg Finance S.A., as issuer, and Ingersoll-Rand plc, Ingersoll-Rand Company Limited, Ingersoll-Rand International Holding Limited, Ingersoll-Rand Company and Ingersoll-Rand Global Holding Company Limited, as guarantors, and The Bank of New York Mellon, as Trustee, relating to the 3.550% Senior Notes due 2024.	Incorporated by reference to Exhibit 4.3 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on October 29, 2014.
4.18	Third Supplemental Indenture, dated as of October 28, 2014, by and among Ingersoll-Rand Luxembourg Finance S.A., as issuer, and Ingersoll-Rand plc, Ingersoll-Rand Company Limited, Ingersoll-Rand International Holding Limited, Ingersoll-Rand Company and Ingersoll-Rand Global Holding Company Limited, as guarantors, and The Bank of New York Mellon, as Trustee, relating to the 4.650% Senior Notes due 2044.	Incorporated by reference to Exhibit 4.4 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on October 29, 2014.
4.19	Fourth Supplemental Indenture, dated as of December 18, 2015, by and among Ingersoll-Rand Luxembourg Finance S.A., as issuer, and Ingersoll-Rand plc, Ingersoll-Rand International Holding Limited, Ingersoll-Rand Company, Ingersoll-Rand Global Holding Company Limited, and Ingersoll-Rand Lux	Incorporated by reference to Exhibit 4.27 to the Company's Form 10-K for the fiscal year ended 2015 (File No. 001-34400) filed with the SEC on February 12, 2016.

Exhibit No.	Description	Method of Filing
4.20	Fifth Supplemental Indenture, dated as of April 5, 2016, by and among Ingersoll-Rand Luxembourg Finance S.A., as Issuer, and Ingersoll-Rand plc, Ingersoll-Rand Company Limited, Ingersoll-Rand Company, Ingersoll-Rand International Holding Limited, Ingersoll-Rand Lux International Holding Company S.à r.l., Ingersoll-Rand Irish Holdings Unlimited Company, as guarantors, and The Bank of New York Mellon, as Trustee.	Incorporated by reference to Exhibit 4.25 to the Company's Form 10-K for the fiscal year ended 2016 (File No. 001-34400) filed with the SEC on February 13, 2017.
4.21	Sixth Supplemental Indenture, dated as of May 1, 2020, by and among Trane Technologies Luxembourg Finance S.A., Trane Technologies plc, Ingersoll-Rand Global Holding Company Limited, Ingersoll-Rand Company, Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., and the Bank of New York Mellon, as Trustee.	Incorporated by reference to Exhibit 4.19 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.22	Seventh Supplemental Indenture, dated as of May 1, 2020, by and among Trane Technologies Luxembourg Finance S.A., Trane Technologies plc, Ingersoll-Rand Global Holding Company Limited, Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., Trane Technologies Company LLC, and the Bank of New York Mellon, as Trustee.	Incorporated by reference to Exhibit 4.20 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.23	Eighth Supplemental Indenture, dated as of May 1, 2020, by and among Trane Technologies Luxembourg Finance S.A., Trane Technologies plc, Ingersoll-Rand Global Holding Company Limited, Trane Technologies Lux International Holding Company S.à.r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., Trane Technologies Company LLC, and the Bank of New York Mellon, as Trustee.	Incorporated by reference to Exhibit 4.21 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.24	Ninth Supplemental Indenture, dated as of May 1, 2020, by and among Trane Technologies Luxembourg Finance S.A., Trane Technologies plc, Ingersoll-Rand Global Holding Company Limited, Trane Technologies Lux International Holding Company S.à.r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., Trane Technologies Company LLC, and the Bank of New York Mellon, as Trustee.	Incorporated by reference to Exhibit 4.22 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.25	Tenth Supplemental Indenture dated as of April 30, 2021, by and among Trane Technologies Financing Limited, Trane Technologies Global Holding Company Limited, Trane Technologies plc, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., and Trane Technologies Company LLC and	Incorporated by reference to Exhibit 4.24 to the Company's 2021 Form 10-K (File No. 001-34400) filed with the SEC on February 7, 2022.

Exhibit No.	Description	Method of Filing
4.27	Indenture, dated as of February 21, 2018, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Luxembourg Finance S.A., Ingersoll-Rand Lux International Holding Company S.à r.l., Ingersoll-Rand Irish Holdings Unlimited Company and Ingersoll-Rand Company, as guarantors, and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit 4.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on February 26, 2018.
4.28	First Supplemental Indenture, dated as of February 21, 2018, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Luxembourg Finance S.A., Ingersoll-Rand Lux International Holding Company S.à r.l., Ingersoll-Rand Irish Holdings Unlimited Company and Ingersoll-Rand Company, as guarantors, and Wells Fargo Bank, National Association, as Trustee, relating to the 2.900% Senior Notes due 2021.	Incorporated by reference to Exhibit 4.2 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on February 26, 2018.
4.29	Second Supplemental Indenture, dated as of February 21, 2018, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Luxembourg Finance S.A., Ingersoll-Rand Lux International Holding Company S.à r.l., Ingersoll-Rand Irish Holdings Unlimited Company and Ingersoll-Rand Company, as guarantors, and Wells Fargo Bank, National Association, as Trustee, relating to the 3.750% Senior Notes due 2028.	Incorporated by reference to Exhibit 4.4 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on February 26, 2018.
4.30	Third Supplemental Indenture, dated as of February 21, 2018, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Luxembourg Finance S.A., Ingersoll-Rand Lux International Holding Company S.à r.l., Ingersoll-Rand Irish Holdings Unlimited Company and Ingersoll-Rand Company, as guarantors, and Wells Fargo Bank, National Association, as Trustee, relating to the 4.300% Senior Notes due 2048.	Incorporated by reference to Exhibit 4.6 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on February 26, 2018.
4.31	Fourth Supplemental Indenture, dated as of March 21, 2019, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Luxembourg Finance S.A., Ingersoll-Rand Lux International Holding Company S.à r.l., Ingersoll-Rand Irish Holdings Unlimited Company and Ingersoll-Rand Company, as guarantors, and Wells Fargo Bank, National Association, as Trustee, relating to the 3.500% Senior Notes due 2026.	Incorporated by reference to Exhibit 4.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on March 26, 2019.
4.32	Fifth Supplemental Indenture, dated as of March 21, 2019, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand	Incorporated by reference to Exhibit 4.3 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on March 26, 2019.

Exhibit No.	Description	Method of Filing
4.33	Sixth Supplemental Indenture, dated as of March 21, 2019, by and among Ingersoll-Rand Global Holding Company Limited, as issuer, Ingersoll-Rand plc, Ingersoll-Rand Luxembourg Finance S.A., Ingersoll-Rand Lux International Holding Company S.à r.l., Ingersoll-Rand Irish Holdings Unlimited Company and Ingersoll-Rand Company, as guarantors, and Wells Fargo Bank, National Association, as Trustee, relating to the 4.500% Senior Notes due 2049.	Incorporated by reference to Exhibit 4.5 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on March 26, 2019.
4.34	Seventh Supplemental Indenture, dated as of May 1, 2020, by and among Ingersoll-Rand Global Holding Company Limited, Trane Technologies Luxembourg Finance S.A., Trane Technologies plc, Ingersoll-Rand Company, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc. and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit 4.30 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.35	Eighth Supplemental Indenture, dated as of May 1, 2020, by and among Ingersoll-Rand Global Holding Company Limited, Trane Technologies Luxembourg Finance S.A., Trane Technologies plc, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., Trane Technologies Company LLC and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit 4.31 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.36	Ninth Supplemental Indenture, dated as of May 1, 2020, by and among Ingersoll-Rand Global Holding Company Limited, Trane Technologies Luxembourg Finance S.A., Trane Technologies plc, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., Trane Technologies Company LLC and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit 4.32 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.37	Tenth Supplemental Indenture, dated as of May 1, 2020, by and among Ingersoll-Rand Global Holding Company Limited, Trane Technologies Luxembourg Finance S.A., Trane Technologies plc, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies HoldCo Inc., Trane Technologies Company LLC and Wells Fargo Bank, National Association, as Trustee.	Incorporated by reference to Exhibit 4.33 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
4.38	Eleventh Supplemental Indenture dated as of April 30, 2021, by and among Trane Technologies Financing Limited, Trane Technologies Global Holding Company Limited, Trane Technologies plc, Trane Technologies Lux International Holding	Incorporated by reference to Exhibit 4.36 to the Company's 2021 Form 10-K (File No. 001-34400) filed with the SEC on February 7, 2022.

Exhibit No.	Description	Method of Filing
4.39	Twelfth Supplemental Indenture dated as of November 20, 2023, by and among Trane Technologies Financing Limited, Trane Technologies plc, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holding Unlimited Company, Trane Technologies HoldCo Inc., Trane Technologies Company LLC, Trane Technologies Americas Holding Corporation, and Trane Technologies Global Holding II Company Limited, and Computershare Trust Company, N.A. acting as Trustee.	Filed herewith.
4.41	Indenture, dated as of March 3, 2023, by and among Trane Technologies Financing Limited, as issuer, Trane Technologies plc, Trane Technologies Global Holding Company Limited, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC and Trane Technologies HoldCo Inc., as guarantors, and Computershare Trust Company, N.A., as Trustee, relating to the 5.250% Senior Notes due 2033.	Incorporated by reference to Exhibit 4.1 to the Company's 2023 Form 8-K (File No. 001-34400) filed with the SEC on March 3, 2023.
4.42	Supplemental Indenture, dated as of March 3, 2023, by and among Trane Technologies Financing Limited, as issuer, Trane Technologies plc, Trane Technologies Global Holding Company Limited, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC and Trane Technologies HoldCo Inc., as guarantors, and Computershare Trust Company, N.A., as Trustee, relating to the 5.250% Senior Notes due 2033.	Incorporated by reference to Exhibit 4.2 to the Company's 2023 Form 8-K (File No. 001-34400) filed with the SEC on March 3, 2023.
4.43	Second Supplemental Indenture, dated as of November 20, 2023, by and among Trane Technologies Financing Limited, as issuer, Trane Technologies plc, Trane Technologies Global Holding Company Limited, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC and Trane Technologies HoldCo Inc., as guarantors, Trane Technologies Americas Holding Corporation and Trane Technologies Global Holding II Company Limited, as New Guarantors and Computershare Trust Company, N.A., as Trustee, relating to the 5.250% Senior Notes due 2033.	Filed herewith.
4.44	Description of Registrant's Securities	Filed herewith.
10.1*	Form of Global Stock Option Award Agreement (February 2024).	Filed herewith
10.2*	Form of Global Restricted Stock Unit Award	Filed herewith

Exhibit No.	Description	Method of Filing
10.4	Credit Agreement dated June 18, 2021 among Trane Technologies Holdco Inc., Trane Technologies Global Holding Company Limited and Trane Technologies Financing Limited, Trane Technologies plc, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC, JPMorgan Chase Bank, N.A., as Administrative Agent, Citibank, N.A., as Syndication Agent, J.P. Morgan Securities LLC and BNP Paribas, as Sustainability Structuring Agents, Deutsche Bank Securities Inc., Goldman Sachs Bank USA, MUFG Bank, Ltd. and U.S. Bank National Association as Documentation Agents, and JPMorgan Chase Bank, N.A., Citibank, N.A., BofA Securities, Inc., BNP Securities Corp. and Mizuho Bank, Ltd., as joint lead arrangers and joint bookrunners, and certain lending institutions from time to time parties thereto.	Incorporated by reference to Exhibit 10.1 to the Company’s Form 8-K (File No. 001-34400) filed with the SEC on June 24, 2021.
10.5	First Amendment dated as of June 30, 2022, to the Credit Agreement dated as of June 18, 2021, among Trane Technologies Holdco Inc, Trane Technologies Global Holding Company Limited, Trane Technologies Financing Limited and JPMorgan Chase Bank N.A. as Administrative Agent.	Incorporated by reference to Exhibit 10.3 to the Company’s Q2 2022 Form 10-Q (File No. 001-34400) filed with the SEC on August 3, 2022.
10.6	Second Amendment dated as of September 20, 2023 dated as of September 20, 2023, to the Credit Agreement dated as of June 18, 2021 (as amended by that First Amendment dated as of June 30, 2022, the “Existing Credit Agreement” and as amended by this Amendment, the “Amended Credit Agreement”), among Trane Technologies Holdco Inc., a Delaware corporation (“Trane Holdco”), Trane Technologies Global Holding Company Limited, a Delaware corporation (“Trane Global”), Trane Technologies Financing Limited.	Incorporated by reference to Exhibit 10.1 to the Company's Q3 2023 Form 10-Q (file No. 001-34400) filed with the SEC on November 1, 2023.
10.7	Consent and Third Amendment dated as of November 20, 2023, to the Credit Agreement dated as of June 18, 2021, among Trane Technologies Holdco Inc., Trane Technologies Global Holding Company Limited, and Trane Technologies Financing Limited, as Borrowers; Trane Technologies PLC, as Guarantor; and JPMorgan Chase Bank N.A. as Administrative Agent.	Filed herewith.

Exhibit No.	Description	Method of Filing
10.8	Credit Agreement dated April 25, 2022 among Trane Technologies Holdco Inc., Trane Technologies Global Holding Company Limited and Trane Technologies Financing Limited, Trane Technologies plc, Trane Technologies Lux International Holding Company S.à r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC, JPMorgan Chase Bank, N.A., as Administrative Agent, Citibank, N.A., as Syndication Agent, J.P. Morgan Securities LLC and BNP Paribas, as Sustainability Structuring Agents, Bank of America, N.A., BNP Paribas, Deutsche Bank Securities Inc., Goldman Sachs Bank USA, MUFG Bank, Ltd. and U.S. Bank, N.A., as Documentation Agents, and JPMorgan Chase Bank, N.A., Citibank, N.A., BofA Securities, Inc., BNP Securities Corp. and Mizuho Bank, Ltd., as joint lead arrangers and joint bookrunners, and certain lending institutions from time to time parties thereto.	Incorporated by reference to Exhibit 10.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on April 28, 2022.
10.9	First Amendment dated as of September 20, 2023 September 20, 2023, to the Credit Agreement dated as of April 25, 2022 (the "Existing Credit Agreement" and as amended by this Amendment, the "Amended Credit Agreement"), among Trane Technologies Holdco Inc., a Delaware corporation ("Trane Holdco"), Trane Technologies Global Holding Company Limited, a Delaware corporation ("Trane Global"), Trane Technologies Financing Limited.	Incorporated by reference to Exhibit 10.2 to the Company's Q3 2023 Form 10-Q (file No. 001-34400) filed with the SEC on November 1, 2023.
10.10	Consent and Second Amendment dated as of November 20, 2023, to the Credit Agreement dated as of April 25, 2022, among Trane Technologies Holdco Inc., Trane Technologies Global Holding Company Limited, Trane Technologies Financing Limited, as Borrowers; Trane Technologies PLC, as Guarantor; and JPMorgan Chase Bank N.A. as Administrative Agent.	Filed herewith.
10.11	Deed Poll Indemnity of Trane Technologies plc dated August 2, 2022	Incorporated by reference to Exhibit 10.1 to the Company's Q2 2022 Form 10-Q (File No. 001-34400) filed with the SEC on August 3, 2022.
10.12	Deed Poll Indemnity of Trane Technologies Lux International Holding company S.à r.l. dated August 2, 2022	Incorporated by reference to Exhibit 10.2 to the Company's Q2 2022 Form 10-Q (File No. 001-34400) filed with the SEC on August 3, 2022.
10.13*	Trane Technologies Incentive Stock Plan of 2013 (amended and restated as of March 2, 2020).	Incorporated by reference to Exhibit 10.9 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.14*	Trane Technologies Incentive Stock Plan of 2018 (amended and restated as of March 2, 2020).	Incorporated by reference to Exhibit 10.10 to the Company's 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9,

Exhibit No.	Description	Method of Filing
10.17*	Trane Technologies Director Deferred Compensation and Stock Award Plan (as amended and restated effective March 2, 2020).	Incorporated by reference to Exhibit 10.13 to the Company’s 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.18*	Trane Technologies Director Deferred Compensation and Stock Award Plan II (as amended and restated effective March 2, 2020).	Incorporated by reference to Exhibit 10.14 to the Company’s 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.19*	Trane Technologies Supplemental Employee Savings Plan (amended and restated effective May 4, 2020).	Incorporated by reference to Exhibit 10.15 to the Company’s 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.20*	Trane Technologies Supplemental Employee Savings Plan II (effective January 1, 2005 and amended and restated through May 4, 2020).	Incorporated by reference to Exhibit 10.16 to the Company’s 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.21*	Trane Inc. Deferred Compensation Plan (as amended and restated as of May 4, 2020, except where otherwise stated).	Incorporated by reference to Exhibit 10.17 to the Company’s 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.22*	Trane Technologies Supplemental Pension Plan (Amended and Restated Effective May 4, 2020).	Incorporated by reference to Exhibit 10.18 to the Company’s 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.23*	Trane Technologies Supplemental Pension Plan II (Amended and Restated Effective May 4, 2020).	Incorporated by reference to Exhibit 10.19 to the Company’s 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.24*	Trane Technologies Elected Officers Supplemental Plan (Effective January 1, 2005 and Amended and Restated effective May 4, 2020).	Incorporated by reference to Exhibit 10.20 to the Company’s 2020 Form 10-K (File No. 001-34400) filed with the SEC on February 9, 2021.
10.25*	Trane Technologies Key Management Supplemental Program (Effective January 1, 2005 and Amended and Restated effective May 4, 2020).	Incorporated by reference to Exhibit 10.22 to the Company’s 2021 Form 10-K (File No. 001-34400) filed with the SEC on February 7, 2022.
10.26*	Description of Annual Incentive Matrix Program.	Incorporated by reference to Exhibit 10.23 to the Company’s 2021 Form 10-K (File No. 001-34400) filed with the SEC on February 7, 2022.
10.27*	Amendment One to the Trane Technologies Key Management Supplemental Program (effective October 11, 2022).	Incorporated by reference to Exhibit 10.23 to the Company's 2022 Form 10-K (File No. 001-34400) filed with the SEC on February 10, 2023.
10.28*	Trane Inc. Deferred Compensation Plan (as Amended and Restated as of May 4, 2020).	Incorporated by reference to Exhibit 10.24 to the Company's 2022 Form 10-K (File No. 001-34400) filed with the SEC on February 10, 2023.
10.29*	Form of Tier 1 Change in Control Agreement (New Officers on or after May 19, 2009).	Incorporated by reference to Exhibit 10.32 to the Company’s Form 10-Q for the period ended June 30, 2009 (File No. 001-34400) filed with the SEC on August 6, 2009.
10.30*	Form of Tier 2 Change in Control Agreement	Incorporated by reference to Exhibit 10.33 to

Exhibit No.	Description	Method of Filing
10.34*	David S. Regnery Letter, dated as of June 3, 2021.	Incorporated by reference to Exhibit 10.1 to the Company's Form 8-K (Filed No. 001-34400) filed with the SEC on June 4, 2021.
10.35*	Christopher J. Kuehn Letter, dated as of December 10, 2019.	Incorporated by reference to Exhibit 10.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on December 10, 2019.
10.36*	Paul A. Camuti Letter, dated December 5, 2019.	Incorporated by reference to Exhibit 10.42 to the Company's 2021 Form 10-K (File No. 001-34400) filed with the SEC on February 7, 2022.
10.37*	Mark Majocha Offer Letter dated October 12, 2022	Incorporated by reference to Exhibit 10.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on October 14, 2022.
10.38*	Beth Elwell Offer Letter dated January 4, 2024	Incorporated by reference to Exhibit 10.1 to the Company's Form 8-K (File No. 001-34400) filed with the SEC on January 10, 2024.
21	List of Subsidiaries of Trane Technologies plc.	Filed herewith.
22.1	List of Guarantors and Subsidiary Issuers of Guaranteed Securities.	Filed herewith.
23.1	Consent of Independent Registered Public Accounting Firm.	Filed herewith.
31.1	Certification of Chief Executive Officer Pursuant to Rule 13a-14(a) or Rule 15d-14(a), as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	Filed herewith.
31.2	Certification of Chief Financial Officer Pursuant to Rule 13a-14(a) or Rule 15d-14(a), as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	Filed herewith.
32	Certifications of Chief Executive Officer and Chief Financial Officer Pursuant to Rule 13a-14(b) or Rule 15d-14(b) and 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	Furnished herewith.
97.1	Trane Technologies plc Clawback / Recoupment Policy	Filed herewith.
97.2	Trane Technologies Financing Limited Clawback / Recoupment Policy	Filed herewith.
101	The following materials from the Company's Annual Report on Form 10-K for the year ended December 31, 2022, formatted in iXBRL (Inline Extensible Business Reporting Language): (i) the Consolidated Statements of Earnings, (ii) the Consolidated Statements of Comprehensive Income, (iii) the Consolidated Balance Sheets, (iv) the Consolidated Statements of Equity, (v) the Consolidated Statements of Cash Flows, and (vi) Notes to Consolidated Financial Statements.	Furnished herewith.

* Management contract or compensatory plan or arrangement.

Item 16. **FORM 10-K SUMMARY**

Not applicable.

SIGNATURES

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

TRANE TECHNOLOGIES PLC
(Registrant)

By:		/s/ David S. Regnery
		David S. Regnery
		Chair of the Board and Chief Executive Officer (Principal Executive Officer)
Date:		February 8, 2024

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

Signature	Title	Date
/s/ David S. Regnery (David S. Regnery)	Chair of the Board and Chief Executive Officer (Principal Executive Officer)	February 8, 2024
/s/ Christopher J. Kuehn (Christopher J. Kuehn)	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	February 8, 2024
/s/ Mark A. Majocha (Mark A. Majocha)	Vice President and Chief Accounting Officer (Principal Accounting Officer)	February 8, 2024
/s/ Kirk E. Arnold (Kirk E. Arnold)	Director	February 8, 2024
/s/ Ana P. Assis (Ana P. Assis)	Director	February 8, 2024
/s/ Ann C. Berzin (Ann C. Berzin)	Director	February 8, 2024
/s/ April Miller Boise (April Miller Boise)	Director	February 8, 2024
/s/ Gary D. Forsee (Gary D. Forsee)	Director	February 8, 2024
/s/ Mark R. George (Mark R. George)	Director	February 8, 2024
/s/ John A. Hayes (John A. Hayes)	Director	February 8, 2024
/s/ Linda P. Hudson (Linda P. Hudson)	Director	February 8, 2024
/s/ Myles P. Lee (Myles P. Lee)	Director	February 8, 2024
/s/ Melissa N. Schaeffer (Melissa N. Schaeffer)	Director	February 8, 2024
/s/ John P. Surma (John P. Surma)	Director	February 8, 2024

TRANCE TECHNOLOGIES PLC
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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Trane Technologies plc

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Trane Technologies plc and its subsidiaries (the "Company") as of December 31, 2023 and 2022 and the related consolidated statements of earnings, of comprehensive income, of equity and of cash flows for each of the three years in the period ended December 31, 2023, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2023, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2023 and 2022, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2023 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2023, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

Critical Audit Matters

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

Revenue Recognition from Contracts with Customers

As described in Notes 2 and 12 to the consolidated financial statements, the Company recognized $17.7 billion of consolidated revenue for the year ended December 31, 2023. Revenue is recognized when control of a good or service promised in a contract (i.e., performance obligation) is transferred to a customer. Control is obtained when a customer has the ability to direct the use of and obtain substantially all of the remaining benefits from that good or service. A majority of the Company's revenue is recognized at a point-in-time as control is transferred at a distinct point in time per the terms of a contract. However, a portion of the Company's revenue is recognized over-time as the customer simultaneously receives control as the Company performs work under a contract. For these arrangements, management uses the cost-to-cost input method as it best depicts the transfer of control to the customer that occurs as the Company incurs costs. The transaction price allocated to performance obligations reflects the Company's expectations about the consideration it will be entitled to receive from a customer. To determine the transaction price, management assesses variable and noncash consideration as well as whether a significant financing component exists.

The principal considerations for our determination that performing procedures relating to revenue recognition from contracts with customers is a critical audit matter are the high degree of auditor effort in performing procedures and evaluating audit evidence related to the Company's revenue recognition of point-in-time and over-time contracts with customers.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the revenue recognition process on the Company's point-in-time and over-time contracts with customers. These procedures also included, among others (i) evaluating revenue transactions on a sample basis by obtaining and inspecting evidence of an arrangement with a customer, evidence of goods delivered or services provided and evidence of consideration received in exchange for transferring those goods or services, and (ii) evaluating the completeness and accuracy of data provided by management.

Valuation of Certain Intangible Assets– Acquisitions of MTA S.p.A., Helmer Scientific Inc., and Nuvolo Technologies Corporation

As described in Note 17 to the consolidated financial statements, during 2023, the Company completed the acquisitions of MTA S.p.A. (MTA), Helmer Scientific Inc. (Helmer), and Nuvolo Technologies Corporation (Nuvolo). The total purchase consideration for the MTA acquisition was $224.4 million, net of cash acquired. Intangible assets fair value associated with the MTA acquisition totaled $93.3 million and primarily relate to customer relationships. The total purchase consideration for the Helmer acquisition was $266.4 million, net of cash acquired. Intangible assets fair value associated with the Helmer acquisition totaled $95.7 million and primarily related to customer relationships. The total purchase price for the Nuvolo acquisition was expected to be $442.9 million, comprised of the upfront cash consideration of $352.6 million paid and the fair value of the contingent consideration arrangements at the acquisition date of $90.3 million. Developed technology makes up a portion of the total intangibles assets fair value of $141.0 million associated with the Nuvolo acquisition. The preliminary valuation of intangible assets related to the acquisitions of MTA, Helmer and Nuvolo was determined by management using an income approach methodology. Management estimated a portion of the fair value of the customer relationships intangible assets using an excess earnings model and a portion using the with and without method. Management estimated a portion of the fair value of the developed technology intangible asset using a relief from royalty approach and a portion using an excess earnings model. Key assumptions include projected cash flows, including revenue growth rates and margins, customer attrition rates, royalty rates and discount rates attributable to each intangible asset.

The principal considerations for our determination that performing procedures relating to the valuation of certain intangible assets related to the acquisitions of MTA, Helmer, and Nuvolo is a critical audit matter are (i) the significant judgment by management when developing the fair value estimates of the customer relationships acquired in the MTA and Helmer acquisitions, and developed technology acquired in the Nuvolo acquisition; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management’s significant assumptions related to the margins and discount rates for the customer relationships and the revenue growth rates, margins, and discount rate for the developed technology; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the

acquisition accounting, including controls over management's valuation of customer relationships and developed technology acquired. These procedures also included, among others (i) reading the purchase agreements; (ii) testing management's process for developing the fair value estimates of the customer relationships acquired in the MTA and Helmer acquisitions and developed technology acquired in the Nuvolo acquisition; (iii) evaluating the appropriateness of the excess earnings models used by management; (iv) testing the completeness and accuracy of certain underlying data used in the excess earnings models; (v) and evaluating the reasonableness of significant assumptions used by management related to the margins and discount rates related to the customer relationships and the revenue growth rates, margins, and discount rate related to the developed technology. Evaluating the reasonableness of management's significant assumptions related to the margins related to the customer relationships and the revenue growth rates and margins related to the developed technology involved considering (i) the past performance of the acquired businesses, (ii) the consistency with external market and industry data, and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in evaluating (i) the appropriateness of the excess earnings models and (ii) the reasonableness of the discount rate assumptions.

/s/ PricewaterhouseCoopers LLP
Charlotte, North Carolina
February 8, 2024

We have served as the Company's auditor since at least 1906. We have not been able to determine the specific year we began serving as auditor of the Company.

Trane Technologies plc
Consolidated Statements of Earnings

In millions, except per share amounts

For the years ended December 31,	2023	2022	2021
Net revenues			
Products	$ 11,975.4	$ 10,930.8	$ 9,498.8
Services	5,702.2	5,060.9	4,637.6
	17,677.6	15,991.7	14,136.4
Costs and expenses			
Cost of products sold	(8,414.2)	(7,935.2)	(6,843.1)
Cost of services sold	(3,406.2)	(3,091.7)	(2,823.7)
Selling and administrative expenses	(2,963.2)	(2,545.9)	(2,446.3)
Operating income	2,894.0	2,418.9	2,023.3
Interest expense	(234.5)	(223.5)	(233.7)
Other income/(expense), net	(92.2)	(23.3)	1.1
Earnings before income taxes	2,567.3	2,172.1	1,790.7
Provision for income taxes	(498.4)	(375.9)	(333.5)
Earnings from continuing operations	2,068.9	1,796.2	1,457.2
Discontinued operations, net of tax	(27.2)	(21.5)	(20.6)
Net earnings	2,041.7	1,774.7	1,436.6
Less: Net earnings from continuing operations attributable to noncontrolling interests	(17.8)	(18.2)	(13.2)
Net earnings attributable to Trane Technologies plc	$ 2,023.9	$ 1,756.5	$ 1,423.4
Amounts attributable to Trane Technologies plc ordinary shareholders:			
Continuing operations	$ 2,051.1	$ 1,778.0	$ 1,444.0
Discontinued operations	(27.2)	(21.5)	(20.6)
Net earnings	$ 2,023.9	$ 1,756.5	$ 1,423.4
Earnings (loss) per share attributable to Trane Technologies plc ordinary shareholders:			
Basic:			
Continuing operations	$ 8.97	$ 7.65	$ 6.05
Discontinued operations	(0.12)	(0.10)	(0.09)
Net earnings	$ 8.85	$ 7.55	$ 5.96
Diluted:			
Continuing operations	$ 8.89	$ 7.57	$ 5.96
Discontinued operations	(0.12)	(0.09)	(0.09)
Net earnings	$ 8.77	$ 7.48	$ 5.87

See accompanying notes to Consolidated Financial Statements.

Trane Technologies plc
Consolidated Statements of Comprehensive Income
In millions

For the years ended December 31,	2023	2022	2021
Net earnings	$ 2,041.7	$ 1,774.7	$ 1,436.6
Other comprehensive income (loss):			
Currency translation	72.5	(202.7)	(122.7)
Cash flow hedges			
Unrealized net gains (losses) arising during period	(4.4)	(24.3)	1.6
Net (gains) losses reclassified into earnings	13.5	10.2	(6.4)
Tax (expense) benefit	(1.6)	2.5	1.1
Total cash flow hedges, net of tax	7.5	(11.6)	(3.7)
Pension and OPEB adjustments:			
Prior service costs for the period	—	(3.3)	0.3
Net actuarial gains (losses) for the period	16.8	54.2	111.4
Amortization reclassified into earnings	7.4	21.6	38.6
Net curtailment and settlement (gains) losses reclassified to earnings	1.4	15.0	8.0
Currency translation and other	(3.7)	12.7	5.2
Tax (expense) benefit	(6.2)	(16.1)	(43.7)
Total pension and OPEB adjustments, net of tax	15.7	84.1	119.8
Other comprehensive income (loss), net of tax	95.7	(130.2)	(6.6)
Comprehensive income, net of tax	$ 2,137.4	$ 1,644.5	$ 1,430.0
Less: Comprehensive income attributable to noncontrolling interests	(18.1)	(16.6)	(12.7)
Comprehensive income attributable to Trane Technologies plc	$ 2,119.3	$ 1,627.9	$ 1,417.3

See accompanying notes to Consolidated Financial Statements.

Trane Technologies plc
Consolidated Balance Sheets

In millions, except share amounts

December 31,	2023	2022
ASSETS		
Current assets:		
Cash and cash equivalents	$ 1,095.3	$ 1,220.5
Accounts and notes receivable, net	2,956.8	2,780.1
Inventories	2,152.1	1,993.8
Other current assets	665.7	384.8
Total current assets	6,869.9	6,379.2
Property, plant and equipment, net	1,772.2	1,536.1
Goodwill	6,095.3	5,503.7
Intangible assets, net	3,439.8	3,264.0
Other noncurrent assets	1,214.7	1,398.6
Total assets	$ 19,391.9	$ 18,081.6
LIABILITIES AND EQUITY		
Current liabilities:		
Accounts payable	$ 2,025.2	$ 2,091.6
Accrued compensation and benefits	591.7	541.2
Accrued expenses and other current liabilities	2,634.7	2,006.0
Short-term borrowings and current maturities of long-term debt	801.9	1,048.0
Total current liabilities	6,053.5	5,686.8
Long-term debt	3,977.9	3,788.3
Postemployment and other benefit liabilities	596.9	667.0
Deferred and noncurrent income taxes	703.7	680.1
Other noncurrent liabilities	1,042.9	1,154.2
Total liabilities	12,374.9	11,976.4
Equity:		
Trane Technologies plc shareholders' equity		
Ordinary shares, $1.00 par value (251,673,874 and 253,328,263 shares issued at December 31, 2023 and 2022, respectively)	251.7	253.3
Ordinary shares held in treasury, at cost (24,500,713 and 24,500,868 shares at December 31, 2023 and 2022, respectively)	(1,719.4)	(1,719.4)
Retained earnings	9,133.7	8,320.9
Accumulated other comprehensive income (loss)	(670.8)	(766.2)
Total Trane Technologies plc shareholders' equity	6,995.2	6,088.6
Noncontrolling interest	21.8	16.6
Total equity	7,017.0	6,105.2
Total liabilities and equity	$ 19,391.9	$ 18,081.6

See accompanying notes to Consolidated Financial Statements.

Trane Technologies plc
Consolidated Statements of Equity

					Trane Technologies plc shareholders' equity		
		Ordinary shares					
In millions, except per share amounts	Total equity	Amount at par value	Shares		Ordinary shares held in treasury, at cost	Capital in excess of par value	Retained earnings
Balance at December 31, 2020	$ 6,427.1	$ 263.3	263.3		$ (1,719.4)	$ —	$ 8,495.3
Net earnings	1,436.6	—	—		—	—	1,423.4
Other comprehensive income (loss)	(6.6)	—	—		—	—	—
Shares issued under incentive stock plans	78.3	2.3	2.3		—	76.0	—
Repurchase of ordinary shares	(1,100.3)	(5.9)	(5.9)		—	(142.5)	(951.9)
Share-based compensation	63.6	—	—		—	66.4	(2.8)
Dividends declared to noncontrolling interest	(14.9)	—	—		—	—	—
Cash dividends declared ($2.36 per share)	(561.8)	—	—		—	—	(561.8)
Separation of Ingersoll Rand Industrial	(49.0)	—	—		—	—	(49.0)
Other	0.1	—	—		—	0.1	—
Balance at December 31, 2021	$ 6,273.1	$ 259.7	259.7		$ (1,719.4)	$ —	$ 8,353.2
Net earnings	1,774.7	—	—		—	—	1,756.5
Other comprehensive income (loss)	(130.2)	—	—			—	—
Shares issued under incentive stock plans	2.6	1.1	1.1		—	1.5	—
Repurchase of ordinary shares	(1,200.2)	(7.5)	(7.5)		—	(45.4)	(1,147.3)
Share-based compensation	54.3	—	—		—	56.2	(1.9)
Dividends declared to noncontrolling interest	(14.5)	—	—		—	—	—

See accompanying notes to Consolidated Financial Statements.

Trane Technologies plc
Consolidated Statements of Cash Flows
In millions

For the years ended December 31,	2023	2022	2021
Cash flows from operating activities:			
Net earnings	$ 2,041.7	$ 1,774.7	$ 1,436.6
Discontinued operations, net of tax	27.2	21.5	20.6
Adjustments for non-cash transactions:			
Depreciation and amortization	348.1	323.6	299.4
Pension and other postretirement benefits	51.0	55.6	50.8
Stock settled share-based compensation	64.3	56.3	66.5
Other non-cash items, net	(32.7)	17.1	(36.4)
Changes in other assets and liabilities, net of the effects of acquisitions:			
Accounts and notes receivable	(110.1)	(345.4)	(265.4)
Inventories	(96.4)	(466.7)	(348.8)
Other current and noncurrent assets	(152.3)	(116.8)	(153.8)
Accounts payable	(125.3)	317.9	275.3
Other current and noncurrent liabilities	411.3	60.9	249.6
Net cash provided by (used in) continuing operating activities	2,426.8	1,698.7	1,594.4
Net cash provided by (used in) discontinued operating activities	(37.2)	(194.7)	(6.1)
Net cash provided by (used in) operating activities	2,389.6	1,504.0	1,588.3
Cash flows from investing activities:			
Capital expenditures	(300.7)	(291.8)	(223.0)
Acquisitions and equity method investments, net of cash acquired	(862.8)	(234.7)	(269.2)
Proceeds from sale of property, plant and equipment	9.2	9.7	15.1
Other investing activities, net	(17.9)	(23.0)	(68.6)
Net cash provided by (used in) continuing investing activities	(1,172.2)	(539.8)	(545.7)
Net cash provided by (used in) discontinued investing activities	—	(0.6)	—
Net cash provided by (used in) investing activities	(1,172.2)	(540.4)	(545.7)
Cash flows from financing activities:			
Short-term borrowings (payments), net	(1.9)	—	—
Proceeds from long-term debt	699.2	—	—
Payments of long-term debt	(754.6)	(9.6)	(432.5)
Net proceeds from (payments of) debt	(57.3)	(9.6)	(432.5)
Debt issuance costs	(6.4)	(2.1)	(2.7)
Dividends paid to ordinary shareholders	(683.7)	(620.2)	(561.1)
Dividends paid to noncontrolling interests	(12.9)	(14.5)	(14.9)
Proceeds (payments) from shares issued under incentive plans, net	79.3	2.6	78.3
Repurchase of ordinary shares	(669.3)	(1,200.2)	(1,100.3)
Settlement related to special cash payment	—	(6.2)	(49.5)
Other financing activities, net	—	(2.0)	(44.9)
Net cash provided by (used in) financing			

See accompanying notes to Consolidated Financial Statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE 1. DESCRIPTION OF COMPANY

Trane Technologies plc, a public limited company, incorporated in Ireland in 2009, and its consolidated subsidiaries (collectively we, our, the Company or Trane Technologies) is a global climate innovator. The Company brings sustainable and efficient solutions to buildings, homes and transportation through the Company's strategic brands, Trane® and Thermo King®, and its environmentally responsible portfolio of products, services and connected intelligent controls. The Company generates revenue and cash primarily through the design, manufacture, sales and service of solutions for Heating, Ventilation and Air Conditioning (HVAC), transport refrigeration, and custom refrigeration solutions.

Reorganization of Aldrich and Murray

On May 1, 2020, certain subsidiaries of the Company underwent an internal corporate restructuring that was effectuated through a series of transactions (2020 Corporate Restructuring). As a result, Aldrich Pump LLC (Aldrich) and Murray Boiler LLC (Murray), indirect wholly-owned subsidiaries of Trane Technologies plc, became solely responsible for the asbestos-related liabilities, and the beneficiaries of the asbestos-related insurance assets, of Trane Technologies Company LLC and Trane U.S. Inc, respectively. On a consolidated basis, the 2020 Corporate Restructuring did not have an impact on the Consolidated Financial Statements. In connection with the 2020 Corporate Restructuring, certain subsidiaries of the Company entered into funding agreements with Aldrich and Murray (collectively the Funding Agreements), pursuant to which those subsidiaries are obligated, among other things, to pay the costs and expenses of Aldrich and Murray during the pendency of the Chapter 11 cases to the extent distributions from their respective subsidiaries are insufficient to do so and to provide an amount for the funding for a trust established pursuant to section 524(g) of the Bankruptcy Code, to the extent that the other assets of Aldrich and Murray are insufficient to provide the requisite trust funding.

On June 18, 2020 (Petition Date), Aldrich and Murray filed voluntary petitions for relief under Chapter 11 of Title 11 of the United States Code (the Bankruptcy Code) in the United States Bankruptcy Court for the Western District of North Carolina (the Bankruptcy Court) to resolve equitably and permanently all current and future asbestos related claims in a manner beneficial to claimants, Aldrich and Murray. As a result of the Chapter 11 filings, all asbestos-related lawsuits against Aldrich and Murray have been stayed due to the imposition of a statutory automatic stay applicable in Chapter 11 bankruptcy cases. Only Aldrich and Murray have filed for Chapter 11 relief. Neither Aldrich's wholly-owned subsidiary, 200 Park, Inc. (200 Park), Murray's wholly-owned subsidiary, ClimateLabs LLC (ClimateLabs), Trane Technologies plc nor its other subsidiaries (the Trane Companies) are part of the Chapter 11 filings. The Trane Companies are expected to continue to operate as usual, with no disruption to their employees, suppliers, or customers globally. However, as of the Petition Date, Aldrich and its wholly-owned subsidiary 200 Park and Murray and its wholly-owned subsidiary ClimateLabs were deconsolidated and their respective assets and liabilities were derecognized from the Company's Consolidated Financial Statements. Refer to Note 20, "Commitments and Contingencies," for more information regarding the Chapter 11 bankruptcy and asbestos-related matters.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

A summary of significant accounting policies used in the preparation of the accompanying Consolidated Financial Statements follows:

Basis of Presentation: The accompanying Consolidated Financial Statements reflect the consolidated operations of the Company and have been prepared in accordance with U.S. Generally Accepted Accounting Principles (GAAP) as defined by the Financial Accounting Standards Board (FASB) within the FASB Accounting Standards Codification (ASC). Intercompany accounts and transactions have been eliminated. The results of operations and cash flows of all discontinued operations have been separately reported as discontinued operations for all periods presented.

The Consolidated Financial Statements include all majority-owned subsidiaries of the Company. A noncontrolling interest in a subsidiary is considered an ownership interest in a majority-owned subsidiary that is not attributable to the parent. The Company includes *Noncontrolling interest* as a component of *Total equity* in the Consolidated Balance Sheets and the *Net earnings attributable* to *noncontrolling interests* are presented as an adjustment from *Net earnings* used to arrive at *Net earnings attributable to Trane Technologies plc* in the Consolidated Statements of Earnings.

Use of Estimates: The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosures of contingent assets and liabilities at the date of the financial statements as well as the reported amounts of revenues and expenses during the reporting period. Estimates are based on several factors including the facts and circumstances available at the time the estimates are made, historical experience, risk of loss, general economic conditions and trends, and the assessment of the probable future outcome. Actual results could differ from those estimates. Estimates and assumptions are reviewed periodically, and the effects of changes, if any, are reflected in the Consolidated Statements of Earnings in the period that they are determined.

Currency Translation: Assets and liabilities of non-U.S. subsidiaries, where the functional currency is not the U.S. dollar, have been translated at year-end exchange rates, and income and expense accounts have been translated using average exchange rates throughout the year. Adjustments resulting from the process of translating an entity's financial statements into the U.S. dollar have been recorded in the equity section of the Consolidated Balance Sheets within *Accumulated other comprehensive income (loss)*. Transactions that are denominated in a currency other than an entity's functional currency are subject to changes in exchange rates with the resulting gains and losses recorded within *Other income/(expense), net.*

Cash and Cash Equivalents: Cash and cash equivalents include cash on hand, demand deposits and all highly liquid investments with original maturities at the time of purchase of three months or less. The Company maintains amounts on deposit at various financial institutions, which may at times exceed federally insured limits. However, management periodically evaluates the credit-worthiness of those institutions and has not experienced any losses on such deposits.

Allowance for Credit Losses: The Company maintains an allowance for credit losses which represents the best estimate of expected loss inherent in the Company's accounts receivable portfolio. This estimate is based upon a two-step policy that results in the total recorded allowance for credit losses. The first step is to record a portfolio reserve based on the aging of the outstanding accounts receivable portfolio and the Company's historical experience with the Company's end markets, customer base and products. The second step is to create a specific reserve for significant accounts as to which the customer's ability to satisfy their financial obligation to the Company is in doubt due to circumstances such as bankruptcy, deteriorating operating results or financial position. In these circumstances, management uses its judgment to record an allowance based on the best estimate of expected loss, factoring in such considerations as the market value of collateral, if applicable. Actual results could differ from those estimates. These estimates and assumptions are reviewed periodically, and the effects of changes, if any, are reflected in the Consolidated Statements of Earnings in the period that they are determined. The Company's allowance for credit losses was $44.8 million and $43.7 million as of December 31, 2023 and 2022, respectively.

Inventories: Depending on the business, U.S. inventories are stated at the lower of cost or market using the last-in, first-out (LIFO) method or the lower of cost and net realizable value (NRV) using the first-in, first-out (FIFO) method. Non-U.S. inventories are stated at the lower of cost and NRV using the FIFO method. At December 31, 2023 and 2022, approximately 59% and 58%, respectively, of all inventory utilized the LIFO method.

Property, Plant and Equipment: Property, plant and equipment are stated at cost, less accumulated depreciation. Assets placed in service are recorded at cost and depreciated using the straight-line method over the estimated useful life of the asset except for leasehold improvements, which are depreciated over the shorter of their economic useful life or their lease term. The range of useful lives used to depreciate property, plant and equipment is as follows:

Buildings	10	to	50	years
Machinery and equipment	2	to	12	years
Software	2	to	7	years

Major expenditures for replacements and significant improvements that increase asset values and extend useful lives are also capitalized. Capitalized costs are amortized over their estimated useful lives using the straight-line method. Repairs and maintenance expenditures that do not extend the useful life of the asset are charged to expense as incurred. The carrying amounts of assets that are sold or retired and the related accumulated depreciation are removed from the accounts in the year of disposal, and any resulting gain or loss is reflected within current earnings.

The Company assesses the recoverability of the carrying value of its property, plant and equipment whenever events or changes in circumstances indicate that the carrying amount of the asset group may not be recoverable. Recoverability is measured by a comparison of the carrying amount of the asset group to the future net undiscounted cash flows expected to be generated by the asset group. If the undiscounted cash flows are less than the carrying amount of the asset group, an impairment loss is recognized for the amount by which the carrying value of the asset group exceeds the fair value of the asset group.

Goodwill and Intangible Assets: The Company records as goodwill the excess of the purchase price over the fair value of the net assets acquired in a business combination. Measurement period adjustments may be recorded once a final valuation has been performed. Goodwill and other indefinite-lived intangible assets are tested and reviewed annually for impairment during the fourth quarter or whenever there is a significant change in events or circumstances that indicate that the fair value of the asset is more likely than not less than the carrying amount of the asset. In addition, an interim impairment test is completed upon a triggering event or when there is a reorganization of reporting structure or disposal of all or a portion of a reporting unit.

Impairment of goodwill is tested at the reporting unit level. The test compares the carrying amount of the reporting unit to its estimated fair value. If the estimated fair value of a reporting unit exceeds its carrying amount, goodwill of the reporting unit is not impaired. To the extent that the carrying value of the reporting unit exceeds its estimated fair value, an impairment loss would be recognized for the amount by which the reporting unit's carrying amount exceeds its fair value, not to exceed the carrying amount of goodwill in that reporting unit.

Intangible assets such as customer-related intangible assets and other intangible assets with finite useful lives are amortized on a straight-line basis over their estimated economic lives. The weighted-average useful lives approximate the following:

Customer relationships	15	years
Other	8	years

The Company assesses the recoverability of the carrying value of its intangible assets with finite useful lives whenever events or changes in circumstances indicate that the carrying amount of the asset group may not be recoverable. Recoverability is measured by a comparison of the carrying amount of an asset group to the future net undiscounted cash flows expected to be generated by the asset group. If the undiscounted cash flows are less than the carrying amount of the asset group, an impairment loss is recognized for the amount by which the carrying value of the asset group exceeds the fair value of the asset group.

Business Combinations: Acquisitions that meet the definition of a business combination are recorded using the acquisition method of accounting. The Company includes the operating results of acquired entities from their respective dates of acquisition. The Company recognizes and measures the identifiable assets acquired, liabilities assumed, including contingent consideration relating to earnout provisions, and any non-controlling interest as of the acquisition date fair value. The excess, if any, of total consideration transferred in a business combination over the fair value of identifiable assets acquired, liabilities assumed and any non-controlling interest is recognized as goodwill. Costs incurred as a result of a business combination other than costs related to the issuance of debt or equity securities are recorded in the period the costs are incurred. Additionally, at each reporting period, contingent consideration is remeasured to fair value, with changes recorded in *Selling and administrative expenses* in the Consolidated Statements of Earnings.

Equity Investments: Partially-owned equity affiliates generally represent 20-50% ownership interests in equity investments where the Company demonstrates significant influence, but does not have a controlling financial interest. Partially-owned equity affiliates are accounted for under the equity method.

The Company invests in companies that complement existing products and services further enhancing its product portfolio. The Company records equity investments for which it does not have significant influence and without a readily determinable fair value at cost with adjustments for observable changes in price or impairment as permitted by the measurement alternative. Investments for which the measurement alternative has been elected are assessed for impairment upon a triggering event. Equity investments without a readily determinable fair value were $69.9 million and $121.0 million for the years ended December 31, 2023 and December 31, 2022, respectively.

Employee Benefit Plans: The Company provides a range of benefits, including pensions, postretirement and postemployment benefits to eligible current and former employees. Determining the cost associated with such benefits is dependent on various actuarial assumptions, including discount rates, expected return on plan assets, compensation increases, mortality, turnover rates, and healthcare cost trend rates. Actuaries perform the required calculations to determine expense in accordance with GAAP. Actual results may differ from the actuarial assumptions and are generally accumulated into *Accumulated other comprehensive income (loss)* and amortized into *Net earnings* over future periods. The Company reviews its actuarial assumptions at each measurement date and makes modifications to the assumptions based on current rates and trends, if appropriate.

Loss Contingencies: Liabilities are recorded for various contingencies arising in the normal course of business. The Company has recorded reserves in the financial statements related to these matters, which are developed using input derived from actuarial estimates and historical and anticipated experience data depending on the nature of the reserve, and in certain instances with consultation of legal counsel, internal and external consultants and engineers. Subject to the uncertainties inherent in estimating future costs for these types of liabilities, the Company believes its estimated reserves are reasonable and does not believe the final determination of the liabilities with respect to these matters would have a material effect on the financial condition, results of operations, liquidity or cash flows of the Company for any year.

Environmental Costs: The Company is subject to laws and regulations relating to protecting the environment. Environmental expenditures relating to current operations are expensed or capitalized as appropriate. Expenditures relating to existing conditions caused by past operations, which do not contribute to current or future revenues, are expensed. Liabilities for remediation costs are recorded when they are probable and can be reasonably estimated, generally no later than the completion of feasibility studies or the Company’s commitment to a plan of action. The assessment of this liability, which is calculated based on existing remediation technology, does not reflect any offset for possible recoveries from insurance companies, and is not discounted.

Asbestos Matters: Prior to the Petition Date, certain of the Company's wholly-owned subsidiaries and former companies were named as defendants in asbestos-related lawsuits in state and federal courts. The Company recorded a liability for actual and anticipated future claims as well as an asset for anticipated insurance settlements. Asbestos-related defense costs were excluded from the asbestos claims liability and were recorded separately as services were incurred. None of the Company's existing or previously-owned businesses were a producer or manufacturer of asbestos. The Company recorded certain income and expenses associated with asbestos liabilities and corresponding insurance recoveries within *Discontinued operations, net of tax*, as they related to previously divested businesses, except for amounts associated with the predecessor of Murray's asbestos liabilities and corresponding insurance recoveries, which were recorded within continuing operations.

Product Warranties: Standard product warranty accruals are recorded at the time of sale and are estimated based upon product warranty terms and historical experience. The Company assesses the adequacy of its liabilities and will make adjustments as necessary based on known or anticipated warranty claims, or as new information becomes available. The Company's extended warranty liability represents the deferred revenue associated with its extended warranty contracts and is amortized into revenue on a straight-line basis over the life of the contract, unless another method is more representative of the costs incurred. The Company assesses the adequacy of its liability by evaluating the expected costs under its existing contracts to ensure these expected costs do not exceed the extended warranty liability.

Income Taxes: Deferred tax assets and liabilities are determined based on temporary differences between 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. The Company recognizes future tax benefits, such as net operating losses and tax credits, to the extent that realizing these benefits is considered in its judgment to be more likely than not. The Company regularly reviews the recoverability of its deferred tax assets considering its historic profitability, projected future taxable income, timing of the reversals of existing temporary differences and the feasibility of its tax planning strategies. Where appropriate, the Company records a valuation allowance with respect to a future tax benefit.

Revenue Recognition: Revenue is recognized when control of a good or service promised in a contract (i.e., performance obligation) is transferred to a customer. Control is obtained when a customer has the ability to direct the use of and obtain substantially all of the remaining benefits from that good or service. The majority of the Company's revenue is recognized at a point-in-time as control is transferred at a distinct point in time per the terms of a contract. However, a portion of the Company's revenue is recognized over-time as the customer simultaneously receives control as the Company performs work under a contract. For these arrangements, the cost-to-cost input method (percentage of completion) is used as it best depicts the transfer of control to the customer that occurs as the Company incurs costs. See Note 12, "Revenue" to the Consolidated Financial Statements for additional information regarding revenue recognition.

Research and Development Costs: The Company conducts research and development activities focused on product and system sustainability improvements such as increasing energy efficiency, developing products that allow for use of lower global warming potential refrigerants, reducing material content in products, and designing products for circularity. These expenditures are expensed when incurred. For the years ended December 31, 2023, 2022 and 2021, these expenditures amounted to $252.3 million, $211.2 million and $193.5 million, respectively.

Recent Accounting Pronouncements

The FASB ASC is the sole source of authoritative GAAP other than the Securities and Exchange Commission (SEC) issued rules and regulations that apply only to SEC registrants. The FASB issues an Accounting Standard Update (ASU) to communicate changes to the codification. The Company considers the applicability and impact of all ASU's. ASU's not listed below were assessed and determined to be either not applicable or are not expected to have a material impact on the consolidated financial statements.

Recently Adopted Accounting Pronouncements

In September 2022, the FASB issued ASU 2022-04, “Liabilities - Supplier Finance Program (Subtopic 405-50): Disclosure of Supplier Program Finance Obligations," which requires that a company that enters into a supplier finance program 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. To achieve that objective, the company should disclose qualitative and quantitative information about its supplier finance programs. The Company adopted this standard on January 1, 2023, except for the amendment on roll forward information which is effective for fiscal years beginning after December 15, 2023. See Note 8, "Supplier Financing Arrangements" for more information regarding the Company's supplier financing program.

In November 2021, the FASB issued ASU 2021-10, "Government Assistance (Topic 832): Disclosures by Business Entities about Government Assistance" (ASU 2021-10), which requires additional disclosures regarding government grants and cash contributions. The additional disclosures required by this update include information about the nature of the transactions and the related accounting policy used to account for the transaction, the financial statement line items affected by the transactions and the amounts applicable to each financial statement line item and significant terms and conditions of the transactions, including commitments and contingencies. ASU 2021-10 is effective for annual periods beginning after December 15, 2021 with early adoption permitted. The Company adopted this standard on January 1, 2022 with no material impact on its Consolidated Financial Statements.

In October 2021, the FASB issued ASU 2021-08, “Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers” (ASU 2021-08), which requires contract assets and contract liabilities acquired in a business combination to be recognized and measured by the acquirer on the acquisition date in accordance with ASC 606, “Revenue from Contracts with Customers” (ASC 606). ASU 2021-08 is effective for fiscal years beginning after December 15, 2022 including interim periods therein with early adoption permitted. The Company early adopted this standard during the fourth quarter of 2021 and applied it retrospectively to all business combinations for which the acquisition date occurred on or after January 1, 2021 resulting in no material impact on its Consolidated Financial Statements.

In December 2019, the FASB issued ASU 2019-12, “Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes" (ASU 2019-12), which simplifies certain aspects of income tax accounting guidance in ASC 740, reducing the complexity of its application. Certain exceptions to ASC 740 presented within the ASU include: intraperiod tax allocation, deferred tax liabilities related to outside basis differences, year-to-date loss in interim periods, among others. ASU 2019-12 is effective for annual reporting periods beginning after December 15, 2020 including interim periods therein with early adoption permitted. The Company adopted this standard on January 1, 2021 with no material impact on its Consolidated Financial Statements.

Accounting Pronouncements Issued but not yet Adopted

In December 2023, the FASB issued ASU 2023-09, "Improvements to Income Tax Disclosures (Topic 740)" (ASU 2023-09) which improves the transparency of income tax disclosures by requiring consistent categories and greater disaggregation of information in the rate reconciliation and income taxes paid disaggregated by jurisdiction. The ASU is effective for annual periods beginning after December 15, 2024. Early adoption is permitted. The Company is currently evaluating the guidance and its impact to the financial statements.

In November 2023, the FASB issued ASU 2023-07, "Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures" (ASU 2023-07) which requires public entities to disclose information about their reportable segments' oversight and significant expenses on an interim and annual basis. The ASU is effective for fiscal years beginning after December 15, 2023 and interim periods within fiscal years beginning after December 15, 2024. Early adoption is permitted. The Company is currently evaluating the guidance and its impact to the financial statements.

In October 2023, the FASB issued ASU 2023-06, "Disclosure Improvements: Codification Amendments in Response to SEC's Disclosure Update and Simplification Initiative" (ASU 2023-06) to amend a variety of disclosure requirements in the ASC. The effective date for each amendment will be the date on with the SEC's removal of that related disclosure from Regulation S-X or Regulation S-K becomes effective. Early adoption is prohibited. Upon adoption, this ASU is not expected to have a material impact on its financial statements and related disclosures.

NOTE 3. INVENTORIES

At December 31, the major classes of inventory were as follows:

In millions	2023	2022
Raw materials	$ 605.1	$ 509.6
Work-in-process	385.1	333.8
Finished goods	1,332.3	1,280.3
	2,322.5	2,123.7
LIFO reserve	(170.4)	(129.9)
Total	$ 2,152.1	$ 1,993.8

The Company performs periodic assessments to determine the existence of obsolete, slow-moving and non-saleable inventories and records necessary provisions to reduce such inventories to the lower of cost and NRV. Reserve balances, primarily related to obsolete and slow-moving inventories, were $143.5 million and $94.3 million at December 31, 2023 and December 31, 2022, respectively.

NOTE 4. PROPERTY, PLANT AND EQUIPMENT

At December 31, the major classes of property, plant and equipment were as follows:

In millions	2023	2022
Land	$ 42.3	$ 36.8
Buildings	832.8	737.7
Machinery and equipment	2,224.4	1,996.8
Software	721.4	677.3
	3,820.9	3,448.6
Accumulated depreciation	(2,048.7)	(1,912.5)
Total	$ 1,772.2	$ 1,536.1

Depreciation expense for the years ended December 31, 2023, 2022 and 2021 was $178.3 million, $176.5 million and $170.5 million, which includes amounts for software amortization of $36.5 million, $42.1 million and $45.7 million, respectively.

NOTE 5. GOODWILL

The changes in the carrying amount of goodwill are as follows:

In millions	Americas	EMEA	Asia Pacific	Total
Net balance as of December 31, 2021	$ 4,185.2	$ 740.8	$ 578.8	$ 5,504.8
Acquisitions [1]	45.3	23.9	27.1	96.3
Currency translation	(3.7)	(49.8)	(43.9)	(97.4)
Net balance as of December 31, 2022	4,226.8	714.9	562.0	5,503.7
Acquisitions [1]	453.7	112.8	—	566.5
Measurement period adjustments	(8.7)	10.0	(0.1)	1.2
Currency translation	3.5	31.3	(10.9)	23.9
Net balance as of December 31, 2023	$ 4,675.3	$ 869.0	$ 551.0	$ 6,095.3

[1] Refer to Note 17, "Acquisitions and Divestitures" for more information regarding acquisitions.

The net goodwill balances at December 31, 2023, 2022 and 2021 include $2,496.0 million of accumulated impairment, primarily related to the Americas segment. The accumulated impairment relates entirely to a charge recorded in 2008.

NOTE 6. INTANGIBLE ASSETS

The following table sets forth the gross amount and related accumulated amortization of the Company's intangible assets at December 31:

In millions	2023 Gross carrying amount	2023 Accumulated amortization	2023 Net carrying amount	2022 Gross carrying amount	2022 Accumulated amortization
Customer relationships	$ 2,384.4	$ (1,731.4)	$ 653.0	$ 2,183.7	$ (1,592.1)
Other	419.6	(243.1)	176.5	261.7	(213.4)
Total finite-lived intangible assets	$ 2,804.0	$ (1,974.5)	$ 829.5	$ 2,445.4	$ (1,805.5)
Trademarks (indefinite-lived)	2,610.3	—	2,610.3	2,624.1	—
Total	$ 5,414.3	$ (1,974.5)	$ 3,439.8	$ 5,069.5	$ (1,805.5)

Intangible asset amortization expense for 2023, 2022 and 2021 was $165.2 million, $142.7 million and $123.6 million, respectively.

Future estimated amortization expense on existing intangible assets in the next five years as of December 31, 2023 amounts to approximately:

In millions	
2024	$ 178
2025	146
2026	93
2027	64
2028	45

NOTE 7. DEBT AND CREDIT FACILITIES

At December 31, *Short-term borrowings and current maturities of long-term debt* consisted of the following:

In millions	2023	2022
Debentures with put feature	$ 295.0	$ 340.8
4.250% Senior notes due 2023	—	699.7
3.550% Senior notes due 2024	499.4	—
Other current maturities of long-term debt	7.5	7.5
Total	$ 801.9	$ 1,048.0

The Company's short-term obligations primarily consist of debentures with put features and current maturities of long-term debt. The weighted-average interest rate for *Short-term borrowings and current maturities of long-term debt* at December 31, 2023 and 2022 was 4.6% and 4.9%, respectively.

Commercial Paper Program

The Company uses borrowings under its commercial paper program for general corporate purposes. The maximum aggregate amount of unsecured commercial paper notes available to be issued, on a private placement basis, under the commercial paper program is $2.0 billion as of December 31, 2023. Under the commercial paper program, the Company may issue notes from time to time through Trane Technologies HoldCo Inc. or Trane Technologies Financing Limited. Each of Trane Technologies plc, Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Lux International Holding Company S.à.r.l., Trane Technologies Americas Holding Corporation, Trane Technologies Global Holding II Company Limited, Trane Technologies Company LLC, Trane Technologies HoldCo Inc. and Trane Technologies Financing Limited provided irrevocable and unconditional guarantees for any notes issued under the commercial paper program. The Company had no outstanding balance under its commercial paper program as of December 31, 2023 and December 31, 2022.

Debentures with Put Feature

At December 31, 2023 and December 31, 2022, the Company had $295.0 million and $340.8 million, respectively, of fixed rate debentures outstanding which contain a put feature that the holders may exercise on each anniversary of the issuance date. If exercised, the Company is obligated to repay in whole or in part, at the holder's option, the outstanding principal amount of the debentures plus accrued interest. If these options are not exercised, the final contractual maturity dates would range between 2027 and 2028. Holders of these debentures had the option to exercise the put feature on each of the outstanding debentures in 2023, subject to the notice requirement. During the year ended December 31, 2023, $45.8 million put options were exercised. No material exercises were made in 2022.

At December 31, *long-term debt* excluding current maturities consisted of:

In millions	2023	2022
7.200% Debentures due 2024-2025	$ 7.5	$ 14.9
3.550% Senior notes due 2024	—	498.7
6.480% Debentures due 2025	149.7	149.7
3.500% Senior notes due 2026	398.9	398.4
3.750% Senior notes due 2028	547.3	546.8
3.800% Senior notes due 2029	746.4	745.8
5.250% Senior notes due 2033	693.3	—
5.750% Senior notes due 2043	495.4	495.2
4.650% Senior notes due 2044	296.6	296.4
4.300% Senior notes due 2048	296.6	296.4
4.500% Senior notes due 2049	346.2	346.0
Total	$ 3,977.9	$ 3,788.3

Scheduled maturities of *long-term debt,* including current maturities, as of December 31, 2023 are as follows:

In millions	
2024	$ 801.9
2025	157.2
2026	398.9
2027	—
2028	547.3
Thereafter	2,874.5
Total	$ 4,779.8

Issuance of Senior Notes

In March 2023, the Company, through its wholly-owned subsidiary Trane Technologies Financing Limited, issued $700.0 million aggregate principal amount of 5.250% senior notes due 2033. The notes are guaranteed by each of Trane Technologies plc, Trane Technologies Americas Holding Corporation, Trane Technologies Global Holding II Company Limited, Trane Technologies Lux International Holding Company S.a.r.l., Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Company LLC and Trane Technologies Holdco Inc. The Company has the option to redeem the notes in whole or in part at any time prior to their stated maturity date at redemption prices set forth in the indenture agreement. The notes are subject to certain customary covenants, however, none of these covenants are considered restrictive to the Company's operations. The net proceeds from the offering were used to fund the redemption of the $700.0 million aggregate principal amount of the outstanding 4.250% senior notes due June 2023.

Other Credit Facilities

The Company maintains two $1.0 billion senior unsecured revolving credit facilities, one of which matures in June 2026 and the other which matures in April 2027 (collectively, the Facilities), through its wholly-owned subsidiaries, Trane Technologies HoldCo Inc. and Trane Technologies Financing Limited (collectively, the Borrowers). The Facilities include Environmental, Social, and Governance (ESG) metrics related to two of the Company's sustainability commitments: a reduction in greenhouse gas intensity and an increase in the percentage of women in management. The Company's annual performance against these ESG metrics may result in price adjustments to the commitment fee and applicable interest rate.

The Facilities provide support for the Company’s commercial paper program and can be used for working capital and other general corporate purposes. Trane Technologies plc, Trane Technologies Irish Holdings Unlimited Company, Trane Technologies Lux International Holding Company S.à.r.l., Trane Technologies Americas Holding Corporation, Trane Technologies Global Holding II Company Limited, and Trane Technologies Company LLC each provide irrevocable and unconditional guarantees for these Facilities. In addition, each Borrower will guarantee the obligations under the Facilities of the other Borrowers. Total commitments of $2.0 billion were unused at December 31, 2023 and December 31, 2022.

Fair Value of Debt

The fair value of the Company's debt instruments at December 31, 2023 and December 31, 2022 was $4.7 billion and $4.6 billion, respectively. The Company measures the fair value of its debt instruments for disclosure purposes based upon observable market prices quoted on public exchanges for similar assets. These fair value inputs are considered Level 2 within the fair value hierarchy. See Note 9, “Fair Value Measurements” for information on the fair value hierarchy.

NOTE 8. SUPPLIER FINANCING ARRANGEMENTS

The Company has an agreement with a U.S. financial institution that allows its suppliers to sell their receivables to the financial institution at the sole discretion of both the supplier and the financial institution on terms that are negotiated between them. The Company may not always be notified when its suppliers sell receivables under this program.

The Company’s obligations to its suppliers, including the amounts due and scheduled payment dates, are not impacted by the suppliers’ decisions to sell their receivables under the program. Outstanding invoices under the supplier financing program were $246.0 million and $247.2 million at December 31, 2023 and December 31, 2022, respectively, which are included within *Accounts payable* in the Consolidated Balance Sheets.

NOTE 9. FAIR VALUE MEASUREMENTS

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value hierarchy that prioritizes information used in developing assumptions when pricing an asset or liability is as follows:

- *Level 1:* Observable inputs such as quoted prices in active markets;
- *Level 2:* Inputs, other than quoted prices in active markets, that are observable either directly or indirectly; and
- *Level 3:* Unobservable inputs where there is little or no market data, which requires the reporting entity to develop its own assumptions.

Observable market data is required to be used in making fair value measurements when available. When inputs used to measure fair value fall within different levels of the hierarchy, the level within which the fair value measurement is categorized is based on the lowest level input that is significant to the fair value measurement.

The following table presents the Company’s fair value hierarchy for those assets and liabilities measured at fair value on a recurring basis as of December 31, 2023:

		Fair value measurements		
In millions	**Fair Value**	**Level 1**	**Level 2**	**Level 3**
Assets:				
Derivative instruments	$ 4.1	$ —	$ 4.1	$ —
Liabilities:				
Derivative instruments	4.8	—	4.8	—
Contingent consideration	90.3	—	—	90.3

The following table presents the Company’s fair value hierarchy for those assets and liabilities measured at fair value on a recurring basis as of December 31, 2022:

In Millions	Fair Value	Fair value measurements Level 1	Level 2	Level 3
Assets:				
Derivative instruments	$ 5.1	$ —	$ 5.1	$ —
Liabilities:				
Derivative instruments	11.9	—	11.9	—
Contingent consideration	49.3	—	—	49.3

Derivative instruments include forward foreign currency contracts and instruments related to non-functional currency balance sheet exposures and commodity swaps. The fair value of the foreign exchange derivatives are determined based on a pricing model that uses spot rates and forward prices from actively quoted currency markets that are readily accessible and observable.

The fair value of the commodity derivatives is valued under a market approach using published prices, where applicable, or dealer quotes.

On November 2, 2023, the Company acquired 100% of Nuvolo Technologies Corporation (Nuvolo). In connection with the acquisition, the Company agreed to two contingent consideration arrangements. The first contingent consideration arrangement, payable of up to $90.0 million in cash, is based on the attainment of key revenue targets from November 2, 2023 through April 2025. If the first contingent consideration targets are met, a second contingent consideration arrangement with no maximum earnout is available to the sellers based on revenues in excess of the initial targets attained from a specified customer contract through April 2025.

On October 15, 2021, the Company acquired 100% of Farrar Scientific Corporation's (Farrar Scientific) assets. In connection with the acquisition, the Company agreed to contingent consideration of up to $115.0 million to be paid in 2025, tied to the attainment of key financial targets during the period January 1, 2022 through December 31, 2024. This additional payment, to the extent earned, will be payable in cash.

Each quarter, the Company is required to remeasure the fair value of the liability as assumptions change and such non-cash adjustments are recorded in *Selling and administrative expenses* in the Consolidated Statements of Earnings. Contingent consideration related to acquisitions are measured at fair value each reporting period using Level 3 unobservable inputs. The fair value of the contingent consideration is determined using the Monte Carlo simulation model based on revenue projections during the earnout period, implied revenue volatility and a risk adjusted discount rate.

The changes in the fair value of the Company's Level 3 liabilities during the years ended December 31, 2023 and 2022 are as follows:

In millions	**2023**	**2022**
Balance at beginning of period	$ 49.3	$ 96.2
Fair value of contingent consideration recorded in connection with acquisitions	90.3	—
Change in fair value of contingent consideration	(49.3)	(46.9)
Balance at end of period	$ 90.3	$ 49.3

The following inputs and assumptions were used in the Monte Carlo simulation model of Nuvolo to estimate the fair value of the contingent consideration at December 31, 2023:

	2023
Discount rate (risk adjusted)	8.14% - 8.48%
Volatility	16.20 %

The following inputs and assumptions were used in the Monte Carlo simulation model of Farrar to estimate the fair value of the contingent consideration at December 31, 2023 and 2022:

	2023	**2022**
Discount rate	13.00 %	12.00 %
Volatility	20.00 %	20.00 %

Refer to Note 17, "Acquisitions and Divestitures" for more information regarding the contingent consideration.

The carrying values of cash and cash equivalents, accounts receivable and accounts payable are a reasonable estimate of their fair value due to the short-term nature of these instruments. There have been no transfers between levels of the fair value hierarchy.

Certain assets are measured at fair value on a non-recurring basis. The Company's equity investments without a readily available fair value are accounted for using the measurement alternative and are measured at fair value when observable transactions of identical or similar securities occurs, or due to an impairment. When indicators of impairment exist or observable price changes of qualified transactions occur, the respective equity investment would be classified within Level 3 of the fair value hierarchy due to the absence of quoted market prices, the inherent lack of liquidity and unobservable inputs used to measure fair value that require management's judgment. During the year ended December 31, 2023, the Company recorded an impairment of an equity investment of $52.2 million within *Other income/(expense), net*.

NOTE 10. LEASES

The Company's lease portfolio includes various contracts for real estate, vehicles, information technology and other equipment. At contract inception, the Company determines a lease exists if the contract conveys the right to control an identified asset for a period of time in exchange for consideration. Control is considered to exist when the lessee has the right to obtain substantially all of the economic benefits from the use of an identified asset as well as the right to direct the use of that asset. If a contract is considered to be a lease, the Company recognizes a lease liability based on the present value of the future lease payments, with an offsetting entry to recognize a right-of-use asset. Options to extend or terminate a lease are included when it is reasonably certain an option will be exercised. As a majority of the Company's leases do not provide an implicit rate within the lease, an incremental borrowing rate is used which is based on information available at the commencement date.

The following table includes a summary of the Company's lease portfolio and Balance Sheet classification:

In millions	Classification	December 31, 2023	December 31, 2022
Assets			
Operating lease right-of-use assets [1]	Other noncurrent assets	$ 513.1	$ 462.5
Liabilities			
Operating lease current	Other current liabilities	155.4	155.8
Operating lease noncurrent	Other noncurrent liabilities	367.3	313.5
Weighted average remaining lease term		5.0 years	3.9 years
Weighted average discount rate		4.5 %	3.0 %

[1] Prepaid lease payments and lease incentives are recorded as part of the right-of-use asset. The net impact was $9.6 million and $6.8 million at December 31, 2023 and December 31, 2022, respectively.

The Company accounts for each separate lease component of a contract and its associated non-lease component as a single lease component. In addition, the Company utilizes a portfolio approach for the vehicle, information technology and equipment asset classes as the application of the lease model to the portfolio would not differ materially from the application of the lease model to the individual leases within the portfolio.

The following table includes lease costs and related cash flow information for the years ended December 31:

In millions	2023	2022
Operating lease expense	$ 187.8	$ 179.4
Variable lease expense	31.0	28.2
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	185.3	179.0
Right-of-use assets obtained in exchange for new operating lease liabilities	179.2	177.0

Operating lease expense is recognized on a straight-line basis over the lease term. In addition, the Company has certain leases that contain variable lease payments which are based on an index, a rate referenced in the lease or on the actual usage of the leased asset. These payments are not included in the right-of-use asset or lease liability and are expensed as incurred as variable lease expense.

Maturities of lease obligations were as follows:

In millions	December 31, 2023
Operating leases:	
2024	$ 179.4
2025	137.2
2026	106.2
2027	67.5
2028	37.9
After 2028	87.3
Total lease payments	$ 615.5
Less: Interest	(92.8)
Present value of lease liabilities	$ 522.7

NOTE 11. PENSIONS AND POSTRETIREMENT BENEFITS OTHER THAN PENSIONS

The Company sponsors several U.S. defined benefit and defined contribution plans covering substantially all of the Company's U.S. employees. Additionally, the Company has many non-U.S. defined benefit and defined contribution plans covering eligible non-U.S. employees. Postretirement benefits other than pensions (OPEB) provide healthcare benefits, and in some instances, life insurance benefits for certain eligible employees.

Pension Plans

The non-contributory defined benefit pension plans covering non-collectively bargained U.S. employees provide benefits on a final average pay formula while plans for most collectively bargained U.S. employees provide benefits on a flat dollar benefit formula or a percentage of pay formula. The non-U.S. pension plans generally provide benefits based on earnings and years of service. The Company also maintains additional other supplemental plans for officers and other key or highly compensated employees.

The following table details information regarding the Company's pension plans at December 31:

In millions		2023		2022
Change in benefit obligations:				
Benefit obligation at beginning of year	$	2,386.1	$	3,394.5
Service cost		34.4		47.5
Interest cost		119.6		70.3
Employee contributions		1.0		0.9
Actuarial (gains) losses [1]		63.7		(810.3)
Benefits paid		(187.9)		(243.1)
Currency translation		22.0		(59.6)
Curtailments, settlements and special termination benefits		(2.4)		(5.0)
Other, including expenses paid		(24.0)		(9.1)
Benefit obligation at end of year	$	2,412.5	$	2,386.1
Change in plan assets:				
Fair value at beginning of year	$	2,051.6	$	2,993.8
Actual return on assets		192.2		(706.7)
Company contributions		93.5		90.5
Employee contributions		1.0		0.9
Benefits paid		(187.9)		(243.1)
Currency translation		22.9		(62.6)
Settlements		(2.4)		(5.0)
Other, including expenses paid		(25.2)		(16.2)
Fair value of assets end of year	$	2,145.7	$	2,051.6
Net unfunded liability	$	(266.8)	$	(334.5)
Amounts included in the balance sheet:				
Other noncurrent assets	$	52.5	$	61.0
Accrued compensation and benefits		(10.8)		(27.3)
Postemployment and other benefit liabilities		(308.5)		(368.2)
Net amount recognized	$	(266.8)	$	(334.5)

[1] Actuarial (gains) losses primarily resulted from changes in discount rates.

It is the Company's objective to contribute to the pension plans to ensure adequate funds, and no less than required by law, are available in the plans to make benefit payments to plan participants and beneficiaries when required. However, certain plans are not or cannot be funded due to either legal, accounting, or tax requirements in certain jurisdictions. As of December 31, 2023, approximately six percent of the Company's projected benefit obligation relates to plans that cannot be funded.

The pretax amounts recognized in *Accumulated other comprehensive income (loss)* were as follows:

In millions	Prior service benefit (cost)	Net actuarial gains (losses)	Total
December 31, 2022	$ (20.9)	$ (509.8)	$ (530.7)
Current year changes recorded to AOCI	—	9.4	9.4
Amortization reclassified to earnings	3.6	16.2	19.8
Settlements/curtailments reclassified to earnings	—	1.4	1.4
Currency translation and other	(0.7)	(3.0)	(3.7)
December 31, 2023	$ (18.0)	$ (485.8)	$ (503.8)

Weighted-average assumptions used to determine the benefit obligation at December 31 were as follows:

	2023	2022
Discount rate:		
U.S. plans	5.16 %	5.51 %
Non-U.S. plans	4.18 %	4.63 %
Rate of compensation increase:		
U.S. plans	4.02 %	4.00 %
Non-U.S. plans	4.07 %	4.25 %

The accumulated benefit obligation for all defined benefit pension plans was $2,372.2 million and $2,343.2 million at December 31, 2023 and 2022, respectively. The projected benefit obligation, accumulated benefit obligation, and fair value of plan assets for pension plans with accumulated benefit obligations more than plan assets were $1,928.6 million, $1,902.3 million and $1,611.0 million, respectively, as of December 31, 2023, and $1,850.0 million, $1,847.0 million and $1,585.6 million, respectively, as of December 31, 2022.

Pension benefit payments are expected to be paid as follows:

In millions	
2024	$ 187.7
2025	195.5
2026	184.9
2027	192.5
2028	178.4
2029-2033	871.8

The components of the Company’s net periodic pension benefit costs for the years ended December 31 include the following:

In millions	2023	2022	2021
Service cost	$ 34.4	$ 47.5	$ 50.9
Interest cost	119.6	70.3	58.6
Expected return on plan assets	(120.3)	(103.8)	(106.2)
Net amortization of:			
Prior service costs (benefits)	3.6	3.9	5.0
Plan net actuarial (gains) losses	16.2	23.3	35.6
Net periodic pension benefit cost	53.5	41.2	43.9
Net curtailment, settlement, and special termination benefits (gains) losses	1.4	15.0	8.0
Net periodic pension benefit cost after net curtailment and settlement (gains) losses	$ 54.9	$ 56.2	$ 51.9
Amounts recorded in continuing operations:			
Operating income	$ 29.6	$ 43.2	$ 47.1
Other income/(expense), net	18.6	9.2	(0.9)
Amounts recorded in discontinued operations	6.7	3.8	5.7
Total	$ 54.9	$ 56.2	$ 51.9

Pension benefit cost for 2024 is projected to be approximately $46 million.

Weighted-average assumptions used to determine net periodic pension cost for the years ended December 31 were as follows:

	2023	2022	2021
Discount rate:			
U.S. plans			
Service cost	5.48 %	3.06 %	2.75 %
Interest cost	5.35 %	2.36 %	1.82 %
Non-U.S. plans			
Service cost	4.82 %	2.07 %	1.56 %
Interest cost	4.65 %	1.62 %	1.09 %
Rate of compensation increase:			
U.S. plans	4.25 %	4.00 %	4.00 %
Non-U.S. plans	4.23 %	4.00 %	4.00 %
Expected return on plan assets:			
U.S. plans	6.25 %	4.00 %	4.00 %
Non-U.S. plans	5.02 %	2.50 %	2.25 %

The expected long-term rate of return on plan assets reflects the average rate of returns expected on the funds invested or to be invested to provide for the benefits included in the projected benefit obligation. The expected long-term rate of return on plan assets is based on what is achievable given the plan’s investment policy, the types of assets held and target asset allocations. The expected long-term rate of return is determined as of the measurement date. The Company reviews each plan and its historical returns and target asset allocations to determine the appropriate expected long-term rate of return on plan assets to be used.

The Company's objective in managing its defined benefit plan assets is to ensure that all present and future benefit obligations are met as they come due. It seeks to achieve this goal while trying to mitigate volatility in plan funded status, contribution, and expense by better matching the characteristics of the plan assets to that of the plan liabilities. The Company utilizes a dynamic approach to asset allocation whereby a plan's allocation to fixed income assets increases as the plan's funded status improves. The Company monitors plan funded status and asset allocation regularly in addition to investment manager performance.

The fair values of the Company’s pension plan assets at December 31, 2023 by asset category were as follows:

	Fair value measurements				
In millions	**Level 1**	**Level 2**	**Level 3**	**Net asset value**	**Total fair value**
Cash and cash equivalents	$ 4.7	$ 43.9	$ —	$ —	$ 48.6
Equity investments:					
Registered mutual funds – equity specialty	—	—	—	78.7	78.7
Commingled funds – equity specialty	—	—	—	262.4	262.4
	—	—	—	341.1	341.1
Fixed income investments:					
U.S. government and agency obligations	—	355.7	—	—	355.7
Corporate and non-U.S. bonds[a]	—	1,079.5	—	—	1,079.5
Asset-backed and mortgage-backed securities	—	12.5	—	—	12.5
Registered mutual funds – fixed income specialty	—	—	—	96.1	96.1
Commingled funds – fixed income specialty	—	—	—	75.0	75.0
Other fixed income[b]	—	—	31.2	—	31.2
	—	1,447.7	31.2	171.1	1,650.0
Derivatives	—	5.9	—	—	5.9
Other[d]	—	—	89.7	—	89.7
Total assets at fair value	$ 4.7	$ 1,497.5	$ 120.9	$ 512.2	$ 2,135.3
Receivables and payables, net					10.4
Net assets available for benefits					$ 2,145.7

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

In millions	Fair value measurements Level 1	Level 2	Level 3	Net asset value	Total fair value
Cash and cash equivalents	$ 3.3	$ 50.6	$ —	$ —	$ 53.9
Equity investments:					
Registered mutual funds – equity specialty	—	—	—	68.0	68.0
Commingled funds – equity specialty	—	—	—	244.5	244.5
	—	—	—	312.5	312.5
Fixed income investments:					
U.S. government and agency obligations	—	323.6	—	—	323.6
Corporate and non-U.S. bonds[(a)]	—	1,065.7	—	—	1,065.7
Asset-backed and mortgage-backed securities	—	12.5	—	—	12.5
Registered mutual funds – fixed income specialty	—	—	—	105.0	105.0
Commingled funds – fixed income specialty	—	—	—	61.7	61.7
Other fixed income[(b)]	—	—	29.3	—	29.3
	—	1,401.8	29.3	166.7	1,597.8
Derivatives	—	(1.5)	—	—	(1.5)
Real estate[(c)]	—	—	0.9	—	0.9
Other[(d)]	—	—	79.6	—	79.6
Total assets at fair value	$ 3.3	$ 1,450.9	$ 109.8	$ 479.2	$ 2,043.2
Receivables and payables, net					8.4
Net assets available for benefits					$ 2,051.6

(a) This class includes state and municipal bonds.

(b) This class includes group annuity and guaranteed interest contracts.

(c) This class includes a private equity fund that invests in real estate.

(d) This investment comprises the Company's non-significant, non-US pension plan assets. It primarily includes insurance contracts.

Cash equivalents are valued using a market approach with inputs including quoted market prices for either identical or similar instruments. Fixed income securities are valued through a market approach with inputs including, but not limited to, benchmark yields, reported trades, broker quotes and issuer spreads. Commingled funds are valued at their daily net asset value (NAV) per share or the equivalent. NAV per share or the equivalent is used for fair value purposes as a practical expedient. NAVs are calculated by the investment manager or sponsor of the fund. Private real estate fund values are reported by the fund manager and are based on valuation or appraisal of the underlying investments. Refer to Note 9, "Fair Value Measurements" for additional information related to the fair value hierarchy. There have been no significant transfers between levels of the fair value hierarchy.

The Company made required and discretionary contributions to its pension plans of $93.5 million in 2023, $90.5 million in 2022, and $55.9 million in 2021 and currently projects that it will contribute approximately $61 million to its plans worldwide in 2024. The Company’s policy allows it to fund an amount, which could be in excess of or less than the pension cost expensed, subject to the limitations imposed by current tax regulations. However, the Company anticipates funding the plans in 2024 in accordance with contributions required by funding regulations or the laws of each jurisdiction.

Most of the Company’s U.S. employees are covered by defined contribution plans. Employer contributions are determined based on criteria specific to the individual plans and amounted to approximately $165 million, $138 million and $126 million in 2023, 2022 and 2021, respectively. The Company’s contributions relating to non-U.S. defined contribution plans and other non-U.S. benefit plans were $30.9 million, $33.8 million and $34.9 million in 2023, 2022 and 2021, respectively.

Multiemployer Pension Plans

The Company also participates in a number of multiemployer defined benefit pension plans related to collectively bargained U.S. employees of Trane. The Company's contributions are determined by the terms of the related collective-bargaining agreements. These multiemployer plans pose different risks to the Company than single-employer plans, including:

1. The Company's contributions to multiemployer plans may be used to provide benefits to all participating employees of the plan, including employees of other employers.
2. In the event that another participating employer ceases contributions to a plan, the Company, together with other remaining participating employers, may be responsible for any unfunded obligations of the employer that ceased making contributions.
3. If the Company chooses to withdraw from any of the multiemployer plans or if a partial withdrawal occurs, the Company may be required to pay a withdrawal liability, based on the underfunded status of the plan.

As of December 31, 2023, the Company does not participate in any multiemployer plans that are individually significant.

Postretirement Benefits Other Than Pensions

The Company sponsors several postretirement plans that provide for healthcare benefits, and in some instances, life insurance benefits that cover certain eligible employees. These plans are unfunded and have no plan assets, but are instead funded by the Company on a pay-as-you-go basis in the form of direct benefit payments. Generally, postretirement health benefits are contributory with contributions adjusted annually. Life insurance plans for retirees are primarily non-contributory.

The following table details changes in the Company’s postretirement plan benefit obligations for the years ended December 31:

In millions		**2023**		**2022**
Benefit obligation at beginning of year	$	266.4	$	342.2
Service cost		1.4		1.8
Interest cost		13.3		6.9
Plan participants’ contributions		—		5.7
Actuarial (gains) losses [1]		(7.4)		(53.7)
Benefits paid, net of Medicare Part D subsidy [2]		(32.4)		(39.8)
Amendments		—		3.3
Benefit obligations at end of year	$	241.3	$	266.4

[1] Actuarial gains in fiscal year 2023 primarily due to plan experience. Actuarial gains in fiscal year 2022 primarily resulted from changes in discount rates.

[2] Amounts are net of Medicare Part D subsidy of $0.4 million in both 2023 and 2022.

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The benefit plan obligations are reflected in the Consolidated Balance Sheets as follows:

In millions	December 31, 2023	December 31, 2022
Accrued compensation and benefits	$ (29.3)	$ (34.2)
Postemployment and other benefit liabilities	(212.0)	(232.2)
Total	$ (241.3)	$ (266.4)

The pre-tax amounts recognized in *Accumulated other comprehensive income (loss)* were as follows:

In millions	Prior service benefit (cost)	Net actuarial gains (losses)	Total
Balance at December 31, 2022	$ (3.3)	$ 120.5	$ 117.2
Current year changes recorded to AOCI	—	7.4	7.4
Amortization reclassified to earnings	0.6	(13.0)	(12.4)
Balance at December 31, 2023	$ (2.7)	$ 114.9	$ 112.2

The components of net periodic postretirement benefit cost for the years ended December 31 were as follows:

In millions	2023	2022	2021
Service cost	$ 1.4	$ 1.8	$ 2.1
Interest cost	13.3	6.9	5.5
Net amortization of:			
Prior service costs (benefits)	0.6	—	—
Plan net actuarial (gains) losses	(13.0)	(5.6)	(2.0)
Net periodic postretirement benefit cost	$ 2.3	$ 3.1	$ 5.6
Amounts recorded in continuing operations:			
Operating income	$ 1.4	$ 1.8	$ 2.1
Other income/(expense), net	1.4	1.4	2.5
Amounts recorded in discontinued operations	(0.5)	(0.1)	1.0
Total	$ 2.3	$ 3.1	$ 5.6

Postretirement cost for 2024 is projected to be $0.1 million. The amount expected to be recognized in net periodic postretirement benefits cost in 2024 for net actuarial gains is approximately $13 million.

Weighted-average assumptions used to determine net periodic benefit cost for the years ended December 31 were as follows:

	2023	2022	2021
Discount rate:			
Benefit obligations at December 31	5.17 %	5.51 %	2.73 %
Net periodic benefit cost			
Service cost	5.54 %	2.82 %	2.40 %
Interest cost	5.38 %	2.33 %	1.84 %
Assumed health-care cost trend rates at December 31:			
Current year medical inflation	6.28 %	6.50 %	6.25 %
Ultimate inflation rate	5.00 %	5.00 %	4.75 %
Year that the rate reaches the ultimate trend rate	2029	2028	2028

Benefit payments for postretirement benefits, which are net of expected plan participant contributions and Medicare Part D subsidy, are expected to be paid as follows:

In millions		
2024	$	30.1
2025		28.2
2026		26.5
2027		24.8
2028		23.3
2029—2033		93.3

NOTE 12. REVENUE

Performance Obligations

A performance obligation is a distinct good, service or a bundle of goods and services promised in a contract. The Company identifies performance obligations at the inception of a contract and allocates the transaction price to individual performance obligations to faithfully depict the Company’s performance in transferring control of the promised goods or services to the customer.

The following are the primary performance obligations identified by the Company:

Equipment. The Company principally generates revenue from the sale of equipment to customers and recognizes revenue at a point in time when control transfers to the customer. Transfer of control is generally determined based on the shipping terms of the contract.

Contracting and installation. The Company enters into various construction-type contracts to design, deliver and build integrated solutions to meet customer specifications. These transactions provide services that range from the development and installation of new HVAC systems to the design and integration of critical building systems to optimize energy efficiency and overall performance. These contracts have a typical term of less than one year and are considered a single performance obligation as multiple combined goods and services promised in the contract represent a single output delivered to the customer. Revenues associated with contracting and installation contracts are recognized over time with progress towards completion measured using the cost-to-cost input method (percentage of completion) as the basis to recognize revenue and an estimated profit. To-date efforts for work performed corresponds with and faithfully depicts transfer of control to the customer.

Services and maintenance. The Company provides various levels of preventative and/or repair and maintenance type service agreements for its customers. The typical length of a contract is between 12 months and 60 months. Revenues associated with these performance obligations are primarily recognized over time on a straight-line basis over the life of the contract as the customer simultaneously receives and consumes the benefit provided by the Company. However, if historical evidence indicates that the cost of providing these services on a straight-line basis is not appropriate, revenue is recognized over the contract period in proportion to the costs expected to be incurred while performing the service. Revenues for certain repair services that do not meet the criteria for over time revenue recognition and sales of parts are recognized at a point in time.

Extended warranties. The Company enters into various warranty contracts with customers related to its products. A standard warranty generally warrants that a product is free from defects in workmanship and materials under normal use and conditions for a certain period of time. The Company’s standard warranty is not considered a distinct performance obligation as it does not provide services to customers beyond assurance that the covered product is free of initial defects. An extended warranty provides a customer with additional time that the Company is liable for covered incidents associated with its products. Extended warranties are purchased separately and can last up to five years. As a result, they are considered separate performance obligations for the Company. Revenue associated with these performance obligations is primarily recognized over time on a straight-line basis over the life of the contract as the customer simultaneously receives and consumes the benefit provided by the Company. However, if historical evidence indicates that the cost of providing these services on a straight-line basis is not appropriate, revenue is recognized over the contract period in proportion to the costs expected to be incurred while performing the service. Refer to Note 20, "Commitments and Contingencies," for more information related to product warranties.

The transaction price allocated to performance obligations reflects the Company’s expectations about the consideration it will be entitled to receive from a customer. To determine the transaction price, variable and non-cash consideration are assessed as well as whether a significant financing component exists. The Company includes variable consideration in the estimated transaction price when it is probable that significant reversal of revenue recognized would not occur when the uncertainty associated with variable consideration is subsequently resolved. The Company considers historical data in determining its best estimates of variable consideration, and the related accruals are recorded using the expected value method.

For projects financed through energy savings, the Company provides financial guarantees for in-process work and financial commitments with end dates varying from the current fiscal year through the completion of such transactions that could be triggered in the event of nonperformance. Additionally, for completed energy savings contracts, the Company has ongoing performance guarantees related to the customers' realization of committed energy savings that are through the measurement and verification portion of contracting and installation agreements. These performance guarantees represent variable consideration and are estimated as part of the overall transaction price. As of December 31, 2023, the Company has outstanding performance guarantees of approximately $1 billion related to completed energy savings contracts that extend from 2024-2049. Since 1995, the Company has recognized an immaterial amount in adjustments to the overall transaction price of energy savings contracts as a result of these performance guarantees.

The Company enters into sales arrangements that contain multiple goods and services. For these arrangements, each good or service is evaluated to determine whether it represents a distinct performance obligation and whether the sales price for each obligation is representative of standalone selling price. If available, the Company utilizes observable prices for goods or services sold separately to similar customers in similar circumstances to evaluate relative standalone selling price. List prices are used if they are determined to be representative of standalone selling prices. Where necessary, the Company ensures that the total transaction price is then allocated to the distinct performance obligations based on the determination of their relative standalone selling price at the inception of the arrangement.

The Company recognizes revenue for delivered goods or services when the delivered good or service is distinct, control of the good or service has transferred to the customer, and only customary refund or return rights related to the goods or services exist. The Company excludes from revenues taxes it collects from a customer that are assessed by a government authority.

Disaggregated Revenue

Net revenues by geography and major type of good or service for the years ended at December 31 were as follows:

In millions	**2023**	**2022**	**2021**
Americas			
Equipment	$ 9,259.7	$ 8,575.1	$ 7,319.8
Services	4,572.3	4,065.7	3,637.3
Total Americas	$ 13,832.0	$ 12,640.8	$ 10,957.1
EMEA			
Equipment	$ 1,700.5	$ 1,420.9	$ 1,328.0
Services	700.7	613.6	616.9
Total EMEA	$ 2,401.2	$ 2,034.5	$ 1,944.9
Asia Pacific			
Equipment	$ 1,015.2	$ 934.8	$ 851.0
Services	429.2	381.6	383.4
Total Asia Pacific	$ 1,444.4	$ 1,316.4	$ 1,234.4
Total Net revenues	$ 17,677.6	$ 15,991.7	$ 14,136.4

Revenue from goods and services transferred to customers at a point in time accounted for approximately 81%, 82% and 82% of the Company's revenue for the years ended December 31, 2023, 2022 and 2021, respectively.

Contract Balances

The opening and closing balances of contract assets and contract liabilities arising from contracts with customers for the period ended December 31, 2023 and December 31, 2022 were as follows:

In millions	Location on Consolidated Balance Sheet	2023		2022
Contract assets - current	*Other current assets*	$ 458.4		$ 201.2
Contract assets - noncurrent	*Other noncurrent assets*	—		239.6
Contract liabilities - current	*Accrued expenses and other current liabilities*	1,301.2		1,010.6
Contract liabilities - noncurrent	*Other noncurrent liabilities*	247.2		471.4

The timing of revenue recognition, billings and cash collections results in accounts receivable, contract assets, and customer advances and deposits (contract liabilities) on the Consolidated Balance Sheets. In general, the Company receives payments from customers based on a billing schedule established in its contracts. Contract assets relate to the conditional right to consideration for any completed performance under the contract when costs are incurred in excess of billings under the percentage of completion methodology. Accounts receivable are recorded when the right to consideration becomes unconditional. Contract liabilities relate to payments received in advance of performance under the contract or when the Company has a right to consideration that is unconditional before it transfers a good or service to the customer. Contract liabilities are recognized as revenue as (or when) the Company performs under the contract. During the fourth quarter of 2023, the Company reclassified $249.0 million and $254.1 million of noncurrent contract assets and liabilities, respectively, to current contract assets and liabilities based on expected contract fulfillment in 2024. During the years ended December 31, 2023 and 2022, changes in contract asset and liability balances were not materially impacted by any other factors.

Approximately 58% of the contract liability balance at December 31, 2022 was recognized as revenue during the year ended December 31, 2023. Additionally, approximately 16% of the contract liability balance at December 31, 2023 was classified as noncurrent and not expected to be recognized as revenue in the next 12 months.

NOTE 13. EQUITY

The authorized share capital of Trane Technologies plc is 1,185,040,000 shares, consisting of (1) 1,175,000,000 ordinary shares, par value $1.00 per share, (2) 40,000 ordinary shares, par value EUR 1.00 and (3) 10,000,000 preference shares, par value $0.001 per share. There were no Euro-denominated ordinary shares or preference shares outstanding at December 31, 2023 or 2022.

The changes in ordinary shares and treasury shares for the year ended December 31, 2023 were as follows:

In millions	Ordinary shares issued	Ordinary shares held in treasury
December 31, 2022	253.3	24.5
Shares issued under incentive plans	1.7	—
Repurchase of ordinary shares	(3.3)	—
December 31, 2023	251.7	24.5

Share repurchases are made from time to time in accordance with management's capital allocation strategy, subject to market conditions and regulatory requirements. Shares acquired and canceled upon repurchase are accounted for as a reduction of *Ordinary Shares* and *Capital in excess of par value*, or *Retained earnings* to the extent *Capital in excess of par value* is exhausted. Shares acquired and held in treasury are presented separately on the balance sheet as a reduction to *Equity* and recognized at cost.

In February 2022, the Company's Board of Directors authorized a share repurchase program of up to $3.0 billion of its ordinary shares (2022 Authorization) upon the completion of its $2.0 billion ordinary share repurchase program authorized in 2021 (2021 Authorization). During the year ended December 31, 2023, the Company repurchased and canceled approximately $669 million of its ordinary shares, thus completing the 2021 Authorization and initiating repurchases under the 2022 Authorization of approximately $469 million of its ordinary shares, leaving $2.5 billion remaining. Additionally, through January 31, 2024 the Company repurchased approximately $81 million of its ordinary shares under the 2022 Authorization.

Accumulated Other Comprehensive Income (Loss)

The changes in *Accumulated other comprehensive income (loss)* were as follows:

In millions	Derivative Instruments	Pension and OPEB Items	Foreign Currency Translation	Total
December 31, 2021	$ 7.1	$ (297.9)	$ (346.8)	$ (637.6)
Other comprehensive income (loss) attributable to Trane Technologies plc	(11.6)	83.8	(200.8)	(128.6)
December 31, 2022	$ (4.5)	$ (214.1)	$ (547.6)	$ (766.2)
Other comprehensive income (loss) attributable to Trane Technologies plc	7.5	15.2	72.7	95.4
December 31, 2023	$ 3.0	$ (198.9)	$ (474.9)	$ (670.8)

The amounts of *Other comprehensive income (loss) attributable to noncontrolling interests* for 2023, 2022 and 2021 were $(0.2) million, $(1.9) million and $(1.7) million, respectively, related to currency translation. Additionally, *Other comprehensive income (loss) attributable to noncontrolling interests* for 2023, 2022, and 2021 includes $0.5 million, $0.3 million, and $1.2 million, respectively, related to pension and postretirement obligation adjustments.

NOTE 14. SHARE-BASED COMPENSATION

The Company accounts for share-based compensation plans under the fair-value based method. Fair value is measured once at the date of grant and is not adjusted for subsequent changes. The Company's share-based compensation plans include programs for stock options, restricted stock units (RSUs), performance share units (PSUs), and deferred compensation. Under the Company's incentive share plan, the total number of ordinary shares authorized by the shareholders is 23.0 million, of which 11.4 million remains available as of December 31, 2023 for future incentive awards.

Compensation Expense

Share-based compensation expense related to continuing operations is included in *Selling and administrative expenses*. The following table summarizes the expenses recognized:

In millions	2023	2022	2021
Stock options	$ 16.1	$ 14.1	$ 16.7
RSUs	23.5	19.7	21.9
PSUs	23.2	20.7	26.1
Deferred compensation	4.3	1.2	3.0
Pre-tax expense	67.1	55.7	67.7
Tax benefit	(16.3)	(13.5)	(16.4)
After-tax expense	$ 50.8	$ 42.2	$ 51.3
Amounts recorded in continuing operations	$ 50.8	$ 42.6	$ 51.3
Amounts recorded in discontinued operations	—	(0.4)	—
Total	$ 50.8	$ 42.2	$ 51.3

Grants issued during the years ended December 31 were as follows:

	2023		2022		2021	
	Number Granted	Weighted-average fair value per award	Number Granted	Weighted-average fair value per award	Number Granted	Weighted-average fair value per award
Stock options	425,444	$ 47.53	430,496	$ 35.96	589,417	$ 29.62
RSUs	214,425	$ 184.35	139,730	$ 165.07	153,806	$ 154.33
Performance shares [(1)]	208,046	$ 207.23	195,930	$ 170.31	284,300	$ 181.84

[(1)] The number of performance shares represents the maximum award level.

Stock Options / RSUs

Eligible participants may receive (i) stock options, (ii) RSUs or (iii) a combination of both stock options and RSUs. The fair value of each of the Company's stock option and RSU awards is expensed on a straight-line basis over the required service period, which is generally the 3-year vesting period. However, for stock options and RSUs granted to retirement eligible employees, the Company recognizes expense for the fair value at the grant date.

The average fair value of the stock options granted is determined using the Black Scholes option pricing model. The following assumptions were used during the year ended December 31:

	2023	2022	2021
Dividend yield	1.50 %	1.60 %	1.60 %
Volatility	29.37 %	28.23 %	27.90 %
Risk-free rate of return	3.62 %	1.56 %	0.45 %
Expected life in years	4.8	4.8	4.8

A description of the significant assumptions used to estimate the fair value of the stock option awards is as follows:

- *Dividend yield* - The Company determines the dividend yield based upon the expected quarterly dividend payments as of the grant date and the current fair market value of the Company's shares.
- *Volatility* - The expected volatility is based on a weighted average of the Company's implied volatility and the most recent historical volatility of the Company's shares commensurate with the expected life.
- *Risk-free rate of return* - The Company applies a yield curve of continuous risk-free rates based upon the published US Treasury spot rates on the grant date.
- *Expected life in years* - The expected life of the Company's stock option awards represents the weighted-average of the actual period since the grant date for all exercised or canceled options and an expected period for all outstanding options.

Changes in options outstanding under the plans for the years 2023, 2022 and 2021 were as follows:

	Shares subject to option	**Weighted-average exercise price**	**Aggregate intrinsic value (millions)**	**Weighted-average remaining life (years)**
December 31, 2020	5,719,358	$ 70.53		
Granted	589,417	150.34		
Exercised	(1,872,069)	64.74		
Cancelled	(25,706)	115.33		
December 31, 2021	4,411,000	$ 83.39		
Granted	430,496	167.93		
Exercised	(633,962)	66.06		
Cancelled	(57,050)	137.38		
December 31, 2022	4,150,484	$ 94.06		
Granted	425,444	182.27		
Exercised	(1,382,846)	80.67		
Cancelled	(21,365)	168.18		
Outstanding December 31, 2023	3,171,717	$ 111.23	$ 420.8	5.4
Exercisable December 31, 2023	2,284,656	$ 88.17	$ 355.8	4.3

The following table summarizes information concerning currently outstanding and exercisable options:

Range of exercise price			Options outstanding: Number outstanding at December 31, 2023	Options outstanding: Weighted-average remaining life (years)	Options outstanding: Weighted-average exercise price	Numb exercisal Decembe 2023
$ 25.01	—	$ 50.00	213,462	1.8	$ 40.10	213,46
50.01	—	75.00	757,205	3.1	66.35	757,20
75.01	—	100.00	506,855	4.1	78.99	506,85
100.01	—	125.00	464,452	5.7	105.28	464,45
125.01	—	150.00	406,450	6.4	148.62	213,67
150.01	—	175.00	415,977	7.9	167.58	113,42
175.01	—	200.00	373,227	8.9	181.30	15,57
200.01	—	250.00	34,089	9.8	213.59	–
$ 46.64	—	$ 231.35	3,171,717	5.4	$ 111.23	2,284,65

At December 31, 2023, there was $10.7 million of total unrecognized compensation cost from stock option arrangements granted under the plan, which is primarily related to unvested shares of non-retirement eligible employees. The aggregate intrinsic value of options exercised during the years ended December 31, 2023 and 2022 was $159.8 million and $61.2 million, respectively. Generally, stock options expire ten years from their date of grant.

The following table summarizes RSU activity for the years 2023, 2022 and 2021:

	RSUs	Weighted-average grant date fair value
Outstanding and unvested at December 31, 2020	489,522	$ 87.75
Granted	153,806	154.33
Vested	(266,041)	82.18
Cancelled	(6,257)	115.11
Outstanding and unvested at December 31, 2021	371,030	$ 118.88
Granted	139,730	165.07
Vested	(202,172)	107.29
Cancelled	(13,935)	136.89
Outstanding and unvested at December 31, 2022	294,653	$ 147.88
Granted	214,425	184.35
Vested	(154,134)	134.87
Cancelled	(13,153)	173.28
Outstanding and unvested at December 31, 2023	341,791	$ 175.65

At December 31, 2023, there was $21.7 million of total unrecognized compensation cost from RSU arrangements granted under the plan, which is related to unvested shares of non-retirement eligible employees.

Performance Shares

The Company has a Performance Share Program (PSP) for key employees. The program provides awards in the form of PSUs based on performance against pre-established objectives. The annual target award level is expressed as a number of the Company's ordinary shares based on the fair market value of the Company's stock on the date of grant. All PSUs are settled in the form of ordinary shares.

PSU awards are earned based 50% upon a performance condition, measured by relative Cash Flow Return on Invested Capital (CROIC) to the S&P 500 Industrials Index over a 3-year performance period, and 50% upon a market condition, measured by the Company's relative total shareholder return (TSR) as compared to the TSR of the S&P 500 Industrials Index over a 3-year performance period. The fair value of the market condition is estimated using a Monte Carlo simulation model in a risk-neutral framework based upon historical volatility, risk-free rates and correlation matrix.

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The following table summarizes PSU activity for the maximum number of shares that may be issued for the years 2023, 2022 and 2021:

	PSUs	Weighted-average grant date fair value
Outstanding and unvested at December 31, 2020	1,018,472	$ 99.53
Granted	284,300	181.84
Vested	(419,088)	82.93
Forfeited	(81,728)	160.86
Outstanding and unvested at December 31, 2021	801,956	$ 131.14
Granted	195,930	170.31
Vested	(346,540)	89.70
Forfeited	(42,320)	164.21
Outstanding and unvested at December 31, 2022	609,026	$ 165.02
Granted	208,046	207.23
Vested	(237,586)	147.33
Forfeited	(20,526)	186.32
Outstanding and unvested at December 31, 2023	558,960	$ 187.47

At December 31, 2023, there was $20.0 million of total unrecognized compensation cost from PSU arrangements based on current performance, which is related to unvested shares. This compensation will be recognized over the required service period, which is generally the three-year vesting period.

Deferred Compensation

The Company allows key employees to defer a portion of their eligible compensation into a number of investment choices, including its ordinary share equivalents. Any amounts invested in ordinary share equivalents will be settled in ordinary shares of the Company at the time of distribution.

NOTE 15. OTHER INCOME/(EXPENSE), NET

The components of *Other income/(expense), net* for the years ended December 31, 2023, 2022 and 2021 were as follows:

In millions	2023	2022	2021
Interest income	$ 15.4	$ 9.2	$ 4.0
Foreign currency exchange loss	(20.1)	(17.9)	(10.7)
Other components of net periodic benefit credit/(cost)	(20.0)	(10.6)	(1.6)
Other activity, net	(67.5)	(4.0)	9.4
Other income/(expense), net	$ (92.2)	$ (23.3)	$ 1.1

Other income/(expense), net includes the results from activities other than core business operations such as interest income and foreign currency gains and losses on transactions that are denominated in a currency other than an entity's functional currency. In addition, the Company includes the components of net periodic benefit credit/(cost) for pension and post retirement obligations other than the service cost component. During the year ended December 31, 2022 the Company recorded a $15.0 million settlement charge for a compensation related payment to a retired executive within other components of net periodic benefit credit/(cost).

Other activity, net primarily includes items associated with certain legal matters, as well as asbestos-related activities. During the year ended December 31, 2023, the Company recorded within other activity, net an impairment of an equity investment of $52.2 million. During the year ended December 31, 2021, the Company recorded a gain of $12.8 million related to the release of a pension indemnification liability, partially offset by a charge of $7.2 million to increase its Funding Agreement liability from asbestos-related activities of Murray. Refer to Note 20, "Commitments and Contingencies," for more information regarding asbestos-related matters.

NOTE 16. INCOME TAXES

Current and deferred provision for income taxes

Earnings before income taxes for the years ended December 31 were taxed within the following jurisdictions:

In millions	2023	2022	2021
United States	$ 1,690.7	$ 1,312.3	$ 995.5
Non-U.S.	876.6	859.8	795.2
Total	$ 2,567.3	$ 2,172.1	$ 1,790.7

The components of the *Provision for income taxes* for the years ended December 31 were as follows:

In millions	2023	2022	2021
Current tax expense (benefit):			
United States	$ 377.6	$ 180.4	$ 247.0
Non-U.S.	174.3	127.7	111.7
Total:	551.9	308.1	358.7
Deferred tax expense (benefit):			
United States	(18.8)	66.5	(42.5)
Non-U.S.	(34.7)	1.3	17.3
Total:	(53.5)	67.8	(25.2)
Total tax expense (benefit):			
United States	358.8	246.9	204.5
Non-U.S.	139.6	129.0	129.0
Total	$ 498.4	$ 375.9	$ 333.5

The *Provision for income taxes* differs from the amount of income taxes determined by applying the applicable U.S. statutory income tax rate to pretax income, as a result of the following differences:

	Percent of pretax income		
	2023	2022	2021
Statutory U.S. rate	21.0 %	21.0 %	21.0 %
Increase (decrease) in rates resulting from:			
Non-U.S. tax rate differential	(1.9)	(2.8)	(2.8)
Tax on U.S. subsidiaries on non-U.S. earnings [(a)]	(0.4)	0.3	(0.3)
State and local income taxes [(b)]	3.2	1.1	2.0
Valuation allowances [(c)]	(1.2)	(0.7)	(1.1)
Stock based compensation	(1.2)	(0.8)	(1.8)
Other adjustments	(0.1)	(0.8)	1.6
Effective tax rate	19.4 %	17.3 %	18.6 %

(a) Net of foreign tax credits

(b) Net of changes in state valuation allowances

(c) Primarily federal and non-U.S., excludes state valuation allowances

Tax incentives, in the form of tax holidays, have been granted to the Company in certain jurisdictions to encourage industrial development. The expiration of these tax holidays varies by country. The tax holidays are conditional on the Company meeting certain employment and investment thresholds. The most significant tax holidays relate to the Company’s qualifying locations in China, Puerto Rico and Panama. The benefit for the tax holidays for the years ended December 31, 2023, 2022 and 2021 was $51.9 million, $52.5 million and $32.6 million, respectively.

Deferred tax assets and liabilities

A summary of the deferred tax accounts at December 31 were as follows:

In millions	2023	2022
Deferred tax assets:		
Inventory and accounts receivable	$ 11.8	$ 11.2
Depreciable and amortizable assets	1.4	2.6
Operating lease liabilities	122.4	112.0
Postemployment and other benefit liabilities	239.2	254.6
Product liability	7.3	5.5
Other reserves and accruals	198.6	181.5
Net operating losses and credit carryforwards	287.4	346.0
Other	41.4	40.7
Gross deferred tax assets	909.5	954.1
Less: deferred tax valuation allowances	(164.0)	(199.8)
Deferred tax assets net of valuation allowances	$ 745.5	$ 754.3
Deferred tax liabilities:		
Inventory and accounts receivable	$ (15.3)	$ (50.7)
Depreciable and amortizable assets	(1,073.2)	(1,069.0)
Operating lease right-of-use assets	(120.2)	(110.4)
Postemployment and other benefit liabilities	(13.0)	(15.7)
Other reserves and accruals	(2.2)	(5.5)
Undistributed earnings of foreign subsidiaries	(35.5)	(28.0)
Other	0.7	(1.6)
Gross deferred tax liabilities	(1,258.7)	(1,280.9)
Net deferred tax assets (liabilities)	$ (513.2)	$ (526.6)

At December 31, 2023, no deferred taxes have been provided for earnings of certain of the Company’s subsidiaries, since these earnings have been and under current plans will continue to be permanently reinvested in these subsidiaries. These earnings amount to approximately $700 million which if distributed would result in additional taxes, which may be payable upon distribution, of approximately $200 million.

At December 31, 2023, the Company had the following operating loss, capital loss and tax credit carryforwards available to offset taxable income in prior and future years:

In millions	Amount	Expiration Period
U.S. Federal net operating loss carryforwards	$ 113.9	2024-Unlimited
U.S. Federal credit carryforwards	95.0	2026-2043
U.S. State net operating loss carryforwards	2,497.0	2024-Unlimited
U.S. State credit carryforwards	27.1	2024-Unlimited
Non-U.S. net operating loss carryforwards	477.3	2024-Unlimited
Non-U.S. credit carryforwards	17.3	Unlimited

The U.S. state net operating loss carryforwards were incurred in various jurisdictions. The non-U.S. net operating loss carryforwards were incurred in various jurisdictions, predominantly in Belgium, Brazil, Luxembourg, and Spain.

Activity associated with the Company's valuation allowance is as follows:

In millions	2023	2022	2021
Beginning balance	$ 199.8	$ 258.6	$ 320.5
Increase to valuation allowance	24.3	5.9	86.5
Decrease to valuation allowance	(57.8)	(65.1)	(113.5)
Write off against valuation allowance	(2.2)	—	(33.0)
Acquisition and purchase accounting	1.3	—	—
Accumulated other comprehensive income (loss)	(1.4)	0.4	(1.9)
Ending balance	$ 164.0	$ 199.8	$ 258.6

During 2023, the Company recorded a net $30.3 million reduction in valuation allowances primarily related to deferred tax assets associated with both foreign tax credits and operations of international subsidiaries. Additional reductions in the valuation allowance related to deferred tax assets associated with foreign tax credits could be recognized in future periods if foreign source income exceeds current projections for the periods 2024 through 2027, the remainder of the carryforward period.

During 2022, the Company recorded a $48.2 million reduction in valuation allowances primarily related to certain net state deferred tax assets resulting from U.S. legal entity restructurings and deferred tax assets associated with foreign tax credits as a result of an increase in the 2022 year and projected foreign source income.

During 2021, the Company recorded a $21.4 million reduction in valuation allowance on deferred tax assets primarily related to foreign tax credits as a result of an increase in current year foreign source income.

Unrecognized tax benefits

The Company has total unrecognized tax benefits of $84.9 million and $82.4 million as of December 31, 2023, and December 31, 2022, respectively. The amount of unrecognized tax benefits that, if recognized, would affect the continuing operations effective tax rate are $43.6 million as of December 31, 2023. A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

In millions	2023	2022	2021
Beginning balance	$ 82.4	$ 65.2	$ 65.4
Additions based on tax positions related to the current year	3.6	3.9	1.0
Additions based on tax positions related to prior years	0.6	22.5	5.1
Reductions based on tax positions related to prior years	(0.5)	(5.9)	(2.4)
Reductions related to settlements with tax authorities	(1.4)	(0.9)	(0.1)
Reductions related to lapses of statute of limitations	(1.0)	(0.6)	(1.0)
Translation (gain) loss	1.2	(1.8)	(2.8)
Ending balance	$ 84.9	$ 82.4	$ 65.2

The Company records interest and penalties associated with the uncertain tax positions within its Provision for income taxes. The Company had reserves associated with interest and penalties, net of tax, of $16.0 million and $11.3 million at December 31, 2023 and December 31, 2022, respectively. For the years ended December 31, 2023 and December 31, 2022, the Company recognized $0.2 million and $3.7 million tax expense, respectively, in interest and penalties, net of tax in continuing operations related to these uncertain tax positions.

The total amount of unrecognized tax benefits relating to the Company's tax positions is subject to change based on future events including, but not limited to, the settlements of ongoing audits and/or the expiration of applicable statutes of limitations. Although the outcomes and timing of such events are highly uncertain, it is reasonably possible that the balance of gross unrecognized tax benefits, excluding interest and penalties, could potentially be reduced by up to approximately $35 million during the next 12 months.

The provision for income taxes involves a significant amount of management judgment regarding interpretation of relevant facts and laws in the jurisdictions in which the Company operates. Future changes in applicable laws, projected levels of taxable income and tax planning could change the effective tax rate and tax balances recorded by the Company. In addition, tax authorities periodically review income tax returns filed by the Company and can raise issues regarding its filing positions, timing and amount of income or deductions, and the allocation of income among the jurisdictions in which the Company operates. A significant period of time may elapse between the filing of an income tax return and the ultimate resolution of an issue raised by a revenue authority with respect to that return. In the normal course of business the Company is subject to examination by taxing authorities throughout the world, including such major jurisdictions as Belgium, Brazil, Canada, China, France, Germany, Ireland, Italy, Luxembourg, Mexico, Singapore, Spain, the Netherlands, the United Kingdom and the United States. These examinations on their own, or any subsequent litigation related to the examinations, may result in additional taxes or penalties against the Company. If the ultimate result of these audits differ from original or adjusted estimates, they could have a material impact on the Company's income tax provision. In general, the examination of the Company's U.S. federal tax returns is complete or effectively settled for years prior to 2016. The Company's U.S. federal income tax returns for 2016 to 2019 are currently under examination by the Internal Revenue Service (IRS). In general, the examination of the Company's material non-U.S. income tax returns is complete or effectively settled for the years prior to 2013, with certain matters prior to 2013 being resolved through appeals and litigation and also unilateral procedures as provided for under double tax treaties.

On December 18, 2023, Ireland enacted legislation related to the 15% minimum tax element of the Organisation for Economic Co-operation and Development's (OECD) tax reform initiative, commonly referred to as "Pillar Two", effective January 1, 2024. The Company is continuing to evaluate the potential impacts of proposed and enacted legislative changes as new guidance becomes available. The legislation does not impact the Company's 2023 effective tax rate.

NOTE 17. ACQUISITIONS AND DIVESTITURES

Acquisitions

Fiscal Year 2023

On May 2, 2023, the Company acquired 100% of MTA S.p.A (MTA) for $224.4 million, net of cash acquired, financed through commercial paper and cash on hand. MTA is a leading industrial process cooling technology business which brings complementary, high-performing solutions to the comprehensive Commercial HVAC product and services portfolios in the EMEA and Americas segments. Intangible assets associated with this acquisition totaled $93.3 million and primarily relate to customer relationships. The excess purchase price over the estimated fair value of net assets acquired was recognized as goodwill and totaled $112.8 million, inclusive of the impact of measurement period adjustments. The goodwill resulting from the acquisition is not deductible for tax purposes. The values assigned to individual assets acquired and liabilities assumed are based on management's current best estimate and subject to change as certain matters are finalized. The primary areas that remain open are related to tax. The results of the acquisition are reported within the EMEA and Americas segments from the date of acquisition.

On May 12, 2023, the Company acquired 100% of Helmer Scientific Inc (Helmer), a precision temperature cooling company in the life sciences vertical within the Americas segment. The aggregate cash paid, net of cash acquired, totaled $266.4 million and was financed through commercial paper and cash on hand. Intangible assets associated with this acquisition totaled $95.7 million and primarily relate to customer relationships. The excess purchase price over the estimated fair value of net assets acquired was recognized as goodwill and totaled $130.0 million, inclusive of the impact of measurement period adjustments. For income tax purposes, the acquisition was treated as an asset purchase and the goodwill will be deductible for tax purposes. The values assigned to individual assets acquired and liabilities assumed are based on management's current best estimate and subject to change as certain matters are finalized. The primary areas that remain open are related to tax. The results of the acquisition are reported within the Americas segment from the date of acquisition.

On November 2, 2023, the Company acquired 100% of Nuvolo, a global leader in modern, cloud-based enterprise asset management and connected workplace software and solutions. The results of the acquisition are reported within the Americas segment from the date of acquisition.

The Company paid $352.6 million in initial cash consideration, financed through cash on hand, and agreed to two additional contingent consideration arrangements. The first contingent consideration arrangement, payable of up to $90.0 million in cash, is based on the attainment of revenue targets from November 2, 2023 through April 2025. If the first contingent consideration targets are met, a second contingent consideration arrangement related to a specified customer contract is available to the sellers, with no maximum earnout, based on revenues attained from that specified customer contract through April 2025. The total purchase price for the acquisition was expected to be $442.9 million, comprised of the upfront cash consideration of $352.6 million paid on November 2, 2023 and the fair value of the contingent consideration arrangements at the acquisition-date of $90.3 million. See

Note 9, "Fair Value Measurements" to the Consolidated Financial Statements for additional information regarding fair value of contingent consideration.

Intangible assets associated with the Nuvolo acquisition totaled $141.0 million and primarily relate to developed technology and customer relationships. The excess purchase price over the estimated fair value of net assets acquired was recognized as goodwill and totaled $317.6 million. The goodwill is primarily attributable to the fair value of market share and revenue growth from Nuvolo. The benefit of access to the workforce is an additional element of goodwill. The goodwill created in the acquisition is not deductible for tax purposes. The fair values of the assets acquired and liabilities assumed, and the related tax balances, are based on preliminary estimates and assumptions. These preliminary estimates and assumptions could change during the measurement period as the Company finalizes the valuations of the assets acquired and liabilities assumed, and the related tax balances.

The preliminary amounts assigned to the major identifiable intangible asset classifications for the 2023 acquisitions were as follows:

In millions	**Weighted-average useful life (in years)**	**Fair value**
Customer relationships	13	$ 189.9
Developed technology	9	107.1
Other	6	33.0
Total intangible assets		$ 330.0

The preliminary valuation of intangible assets was determined using an income approach methodology. The Company estimated a portion of the fair value of the customer relationships intangible assets using an excess earnings model and a portion using the with and without method. The Company estimated a portion of the fair value of the developed technology intangible asset using a relief from royalty approach and a portion using an excess earnings model. These fair value measurements were based on significant inputs not observable in the market and thus represent a Level 3 measurement. Key assumptions include projected cash flows, including revenue growth rates and margins, customer attrition rates, royalty rates and discount rates attributable to each intangible asset.

The Company has not included pro forma financial information for the 2023 acquisitions as the impact was not significant.

Fiscal Year 2022

On October 31, 2022, the Company acquired 100% of AL-KO Air Technology (AL-KO) for $111.7 million, net of cash acquired, financed through cash on hand, and inclusive of the impact of measurement period adjustments. AL-KO designs, engineers, manufactures, sells, installs, and services air handling and extraction systems in commercial applications. Intangible assets associated with this acquisition totaled $49.4 million and primarily relate to customer relationships. The excess purchase price over the estimated fair value of net assets acquired was recognized as goodwill and totaled $48.5 million, inclusive of the impact of measurement period adjustments. The results of operations of AL-KO are reported within the EMEA and Asia Pacific segments from the date of acquisition.

On April 1, 2022, the Company acquired a Commercial HVAC independent dealer, reported within the Americas segment from the date of acquisition, to support the Company's ongoing strategy to expand its distribution network and service area. The aggregate cash paid, net of cash acquired, totaled $110.0 million and was financed through cash on hand. Intangible assets associated with this acquisition totaled $52.7 million and primarily relate to customer relationships. The excess purchase price over the estimated fair value of net assets acquired was recognized as goodwill and totaled $42.5 million.

The preliminary amounts assigned to the major identifiable intangible asset classifications for the 2022 acquisitions were as follows:

In millions	**Weighted-average useful life (in years)**	**Fair value**
Customer relationships	15	$ 82.9
Other	6	19.2
Total intangible assets		$ 102.1

The valuation of intangible assets was determined using an income approach methodology. The fair value of the customer relationship intangible assets were determined using the excess earnings method based on discounted projected net cash flows associated with the net earnings attributable to the acquired customer relationships. These projected cash flows are estimated over the remaining economic life of the intangible asset and are considered from a market participant perspective. Key assumptions used in estimating future cash flows included projected revenue growth rates and customer attrition rates. The projected future cash flows are discounted to present value using an appropriate discount rate.

The Company has not included pro forma financial information for the 2022 acquisitions as the impact was not significant.

Fiscal Year 2021

On October 15, 2021, the Company acquired 100% of Farrar Scientific's assets, including its patented ultra-low temperature control technologies, a development and assembly operation in Marietta, Ohio, and a specialized team of engineers, sales engineers, operators, and technicians. Farrar Scientific is a leader in ultra-low temperature control for biopharmaceutical and other life science applications. The results of Farrar Scientific are reported within the Americas segment from the date of acquisition.

The Company paid $251.2 million in initial cash consideration, financed through cash on hand, and agreed to contingent consideration of up to $115.0 million to be paid in 2025, tied to the attainment of key revenue targets during the period of January 1, 2022 through December 31, 2024. The purchase price for the acquisition was expected to be $349.9 million, comprised of the upfront cash consideration of $251.2 million paid on October 15, 2021 and the fair value of the earnout payment at the time of closing the acquisition of $98.7 million. See Note 9, "Fair Value Measurements" to the Consolidated Financial Statements for additional information regarding fair value of contingent consideration.

The aggregate purchase price has been allocated to the assets acquired and liabilities assumed based on the estimate of fair market value of such assets and liabilities at the date of acquisition. Intangible assets associated with the acquisition totaled $140.7 million and primarily relate to customer relationships. The excess purchase price over the estimated fair value of net assets acquired was recognized as goodwill and totaled $203.6 million.

The Company recorded intangible assets based on their estimated fair value, which consisted of the following:

In millions	**Weighted-average useful life (in years)**	**October 15, 2021**
Customer relationships	14	$ 105.2
Other	6	35.5
Total intangible assets		$ 140.7

The goodwill is primarily attributable to the fair value of market share and revenue growth from Farrar Scientific. The benefit of access to the workforce is an additional element of goodwill. For income tax purposes, the acquisition was an asset purchase and the goodwill will be deductible for tax purposes.

The Company has not included pro forma financial information for the 2021 acquisitions as the impact was not significant.

Divestitures

The Company has retained obligations from previously sold businesses that primarily include ongoing expenses for postretirement benefits, product liability, legal costs and asbestos-related activities of Aldrich. The components of *Discontinued operations, net of tax* for the years ended December 31 were as follows:

In millions	**2023**	**2022**	**2021**
Pre-tax earnings (loss) from discontinued operations	(34.7)	(26.9)	(39.3)
Tax benefit (expense)	7.5	5.4	18.7
Discontinued operations, net of tax	$ (27.2)	$ (21.5)	$ (20.6)

For the years ended December 31, 2023 and 2022, pre-tax earnings (loss) from discontinued operations included a charge of $20.2 million and $16.5 million, respectively, to support Aldrich's ongoing legal costs in accordance with the Company's Funding Agreement. For the year ended December 31, 2021, pre-tax earnings (loss) from discontinued operations included a charge of $14.0 million to increase the Company's Funding Agreement liability from asbestos-related activities of Aldrich as well as pension and post retirement obligations and environmental costs related to businesses formerly owned by the Company. Refer to Note 20, "Commitments and Contingencies," for more information regarding the deconsolidation and asbestos-related matters.

NOTE 18. EARNINGS PER SHARE (EPS)

Basic EPS is calculated by dividing *Net earnings attributable to Trane Technologies plc* by the weighted-average number of ordinary shares outstanding for the applicable period. Diluted EPS is calculated after adjusting the denominator of the basic EPS calculation for the effect of all potentially dilutive ordinary shares, which in the Company's case, includes shares issuable under share-based compensation plans. The following table summarizes the weighted-average number of ordinary shares outstanding for basic and diluted earnings per share calculations:

In millions	**2023**	**2022**	**2021**
Weighted-average number of basic shares outstanding	228.6	232.6	238.7
Shares issuable under incentive share plans	2.1	2.3	3.6
Weighted-average number of diluted shares outstanding	230.7	234.9	242.3
Anti-dilutive shares	0.4	0.8	—
Dividends declared per ordinary share	$ 3.00	$ 2.68	$ 2.36

NOTE 19. BUSINESS SEGMENT INFORMATION

The Company operates under four regional operating segments designed to create deep customer focus and relevance in markets around the world. The Company determined that its two Europe, Middle East and Africa (EMEA) operating segments meet the aggregation criteria based on similar operating and economic characteristics, resulting in one reportable segment. Therefore, the Company has three regional reportable segments, Americas, EMEA and Asia Pacific. In January 2024, the Company aligned its operating segments with its three regional reportable segments. Intercompany sales between segments are immaterial.

- The Company's Americas segment innovates for customers in North America and Latin America. The Americas segment encompasses commercial heating, cooling and ventilation systems, building controls and solutions, and energy services and solutions; residential heating and cooling; and transport refrigeration systems and solutions.
- The Company's EMEA segment innovates for customers in the Europe, Middle East and Africa region. The EMEA segment encompasses heating, cooling and ventilation systems, services and solutions for commercial buildings, and transport refrigeration systems and solutions.
- The Company's Asia Pacific segment innovates for customers throughout the Asia Pacific region. The Asia Pacific segment encompasses heating, cooling and ventilation systems, services and solutions for commercial buildings, and transport refrigeration systems and solutions.

Management measures segment operating performance based on net earnings excluding interest expense, income taxes, depreciation and amortization, restructuring, non-cash adjustment for contingent consideration, insurance settlements on property claims, merger and acquisition-related costs, impairment of an equity investment, unallocated corporate expenses and discontinued operations (Segment Adjusted EBITDA). Segment Adjusted EBITDA is not defined under GAAP and may not be comparable to similarly-titled measures used by other companies and should not be considered a substitute for net earnings or other results reported in accordance with GAAP. The Company believes Segment Adjusted EBITDA provides the most relevant measure of profitability as well as earnings power and the ability to generate cash. This measure is a useful financial metric to assess the Company's operating performance from period to period by excluding certain items that it believes are not representative of its core business and the Company uses this measure for business planning purposes. Segment Adjusted EBITDA also provides a useful tool for assessing the comparability between periods and the Company's ability to generate cash from operations sufficient to pay taxes, to service debt and to undertake capital expenditures because it eliminates non-cash charges such as depreciation and amortization expense.

A summary of operations by reportable segment for the years ended December 31 were as follows:

In millions	2023	2022	2021
Net revenues			
Americas	$ 13,832.0	$ 12,640.8	$ 10,957.1
EMEA	2,401.2	2,034.5	1,944.9
Asia Pacific	1,444.4	1,316.4	1,234.4
Total Net revenues	$ 17,677.6	$ 15,991.7	$ 14,136.4
Segment Adjusted EBITDA			
Americas	$ 2,669.6	2,326.3	2,008.8
EMEA	464.7	338.1	359.2
Asia Pacific	321.3	248.3	228.5
Total Segment Adjusted EBITDA	$ 3,455.6	$ 2,912.7	$ 2,596.5
Reconciliation of Segment Adjusted EBITDA to earnings before income taxes			
Total Segment Adjusted EBITDA	$ 3,455.6	$ 2,912.7	$ 2,596.5
Interest expense	(234.5)	(223.5)	(233.7)
Depreciation and amortization	(348.1)	(323.6)	(299.4)
Restructuring costs	(15.1)	(20.7)	(27.0)
Non-cash adjustments for contingent consideration	49.3	46.9	—
Insurance settlements on property claims	10.0	25.0	—
Impairment of equity investment	(52.2)	—	—
Acquisition inventory step-up	(6.4)	(0.8)	—
Unallocated corporate expenses	(291.3)	(243.9)	(245.7)
Earnings before income taxes	$ 2,567.3	$ 2,172.1	$ 1,790.7
Depreciation and Amortization			
Americas	$ 259.2	$ 256.9	$ 227.6
EMEA	51.4	28.8	33.3
Asia Pacific	19.1	17.6	16.5
Depreciation and amortization from reportable segments	$ 329.7	$ 303.3	$ 277.4
Unallocated depreciation and amortization	18.4	20.3	22.0
Total depreciation and amortization	$ 348.1	$ 323.6	$ 299.4
Capital Expenditures			
Americas	$ 217.2	$ 230.5	$ 148.7
EMEA	31.9	25.9	23.6
Asia Pacific	14.3	11.2	20.6
Capital expenditures from reportable segments	$ 263.4	$ 267.6	$ 192.9
Corporate capital expenditures	37.3	24.2	30.1
Total capital expenditures	$ 300.7	$ 291.8	$ 223.0

At December 31, a summary of long-lived assets by geographic area were as follows:

In millions	2023	2022
United States	$ 1,618.6	$ 1,413.8
Non-U.S.	666.7	584.8
Total	$ 2,285.3	$ 1,998.6

NOTE 20. COMMITMENTS AND CONTINGENCIES

The Company is involved in various litigation, claims and administrative proceedings, including those related to the bankruptcy proceedings for Aldrich and Murray and environmental and product liability matters. The Company records accruals for loss contingencies when it is both probable that a liability will be incurred and the amount of the loss can be reasonably estimated. Amounts recorded for identified contingent liabilities are estimates, which are reviewed periodically and adjusted to reflect additional information when it becomes available. Subject to the uncertainties inherent in estimating future costs for contingent liabilities, except as expressly set forth in this note, management believes that any liability which may result from these legal matters would not have a material adverse effect on the financial condition, results of operations, liquidity or cash flows of the Company.

Asbestos-Related Matters

Certain wholly-owned subsidiaries and former companies of the Company have been named as defendants in asbestos-related lawsuits in state and federal courts. In virtually all of the suits, a large number of other companies have also been named as defendants. The vast majority of those claims were filed against predecessors of Aldrich and Murray and generally allege injury caused by exposure to asbestos contained in certain historical products sold by predecessors of Aldrich or Murray, primarily pumps, boilers and railroad brake shoes. None of the Company's existing or previously-owned businesses were a producer or manufacturer of asbestos.

On June 18, 2020, Aldrich and Murray filed voluntary petitions for relief under Chapter 11 of the Bankruptcy Code to resolve equitably and permanently all current and future asbestos related claims in a manner beneficial to claimants and to Aldrich and Murray. As a result of the Chapter 11 filings, all asbestos-related lawsuits against Aldrich and Murray have been stayed due to the imposition of a statutory automatic stay applicable in Chapter 11 bankruptcy cases. In addition, at the request of Aldrich and Murray, the Bankruptcy Court has entered an order temporarily staying all asbestos-related claims against the Trane Companies that relate to claims against Aldrich or Murray (except for asbestos-related claims for which the exclusive remedy is provided under workers' compensation statutes or similar laws). On August 23, 2021, the Bankruptcy Court entered its findings of facts and conclusions of law and order declaring that the automatic stay applies to certain asbestos related claims against the Trane Companies and enjoining such actions. As a result, all asbestos-related lawsuits against Aldrich, Murray and the Trane Companies remain stayed.

The goal of these Chapter 11 filings is to resolve equitably and permanently all current and future asbestos-related claims in a manner beneficial to claimants and to Aldrich and Murray through court approval of a plan of reorganization that would create a trust pursuant to section 524(g) of the Bankruptcy Code, establish claims resolution procedures for all current and future asbestos-related claims against Aldrich and Murray and channel such claims to the trust for resolution in accordance with those procedures. Aldrich and Murray intend to seek an agreement with representatives of the asbestos claimants on the terms of a plan for the establishment of such a trust.

Prior to the Petition Date, predecessors of each of Aldrich and Murray had been litigating asbestos-related claims brought against them. No such claims have been paid since the Petition Date, and it is not contemplated that any such claims will be paid until the end of the Chapter 11 cases.

From an accounting perspective, the Company no longer has control over Aldrich and Murray as of the Petition Date as their activities are subject to review and oversight by the Bankruptcy Court. Therefore, Aldrich and its wholly-owned subsidiary 200 Park and Murray and its wholly-owned subsidiary ClimateLabs were deconsolidated as of the Petition Date and their respective assets and liabilities were derecognized from the Company's Consolidated Financial Statements. Amounts derecognized in 2020 primarily related to the legacy asbestos-related liabilities and asbestos-related insurance recoveries and $41.7 million of cash.

Accounting Treatment Prior to the Petition Date

Historically, the Company performed a detailed analysis and projected an estimated range of the Company’s total liability for pending and unasserted future asbestos-related claims. The Company recorded the liability at the low end of the range as it believed that no amount within the range was a better estimate than any other amount. Asbestos-related defense costs were excluded from the liability and were recorded separately as services were incurred. The methodology used to prepare estimates relied upon and included the following factors, among others:

- the interpretation of a widely accepted forecast of the population likely to have been occupationally exposed to asbestos;
- epidemiological studies estimating the number of people likely to develop asbestos-related diseases such as mesothelioma and lung cancer;

- the Company's historical experience with the filing of non-malignancy claims and claims alleging other types of malignant diseases filed against the Company relative to the number of lung cancer claims filed against the Company;

- the analysis of the number of people likely to file an asbestos-related personal injury claim against the Company based on such epidemiological and historical data and the Company's claims history;
- an analysis of the Company's pending cases, by type of disease claimed and by year filed;
- an analysis of the Company's history to determine the average settlement and resolution value of claims, by type of disease claimed;
- an adjustment for inflation in the future average settlement value of claims, at a 2.5% annual inflation rate, adjusted downward to 1.0% to take account of the declining value of claims resulting from the aging of the claimant population; and
- an analysis of the period over which the Company has and is likely to resolve asbestos-related claims against it in the future (currently projected through 2053).

Prior to the Petition Date, over 73 percent of the open and active claims against the Company were non-malignant or unspecified disease claims. In addition, the Company had a number of claims which had been placed on inactive or deferred dockets and expected to have little or no settlement value against the Company.

Prior to the Petition Date, the costs associated with the settlement and defense of asbestos-related claims, insurance settlements on asbestos-related matters and the revaluation of the Company's liability for potential future claims and recoveries were included in the Consolidated Statements of Earnings within continuing operations or discontinued operations depending on the business to which they relate. Income and expenses associated with asbestos-related matters of Aldrich and its predecessors were recorded within discontinued operations as they related to previously divested businesses, primarily Ingersoll-Dresser Pump, which was sold by the Company in 2000. Income and expenses associated with asbestos-related matters for Murray and its predecessors were recorded within continuing operations.

The amounts recorded by the Company for asbestos-related liabilities and insurance-related assets were based on currently available information. Key assumptions underlying the estimated asbestos-related liabilities included the number of people occupationally exposed and likely to develop asbestos-related diseases such as mesothelioma and lung cancer, the number of people likely to file an asbestos-related personal injury claim against the Company, the average settlement and resolution of each claim and the percentage of claims resolved with no payment. Furthermore, predictions with respect to estimates of the liability were subject to greater uncertainty as the projection period lengthens. Other factors that have affected the Company's liability include uncertainties surrounding the litigation process from jurisdiction to jurisdiction and from case to case, reforms that have been made by state and federal courts, and the passage of state or federal tort reform legislation.

The aggregate amount of the stated limits in insurance policies available to Aldrich and Murray for asbestos-related claims acquired, over many years and from many different carriers, is substantial. However, as a result of limitations in that coverage, the projected total liability to claimants substantially exceeds the probable insurance recovery.

Accounting Treatment After the Petition Date

Upon deconsolidation in 2020, the Company recorded its retained interest in Aldrich and Murray at fair value within *Other noncurrent assets* in the Consolidated Balance Sheets. In determining the fair value of its equity investment, the Company used a market-adjusted multiple of earnings valuation technique. As a result, the Company recorded an aggregate equity investment of $53.6 million as of the Petition Date.

Simultaneously, the Company recognized a liability of $248.8 million within *Other noncurrent liabilities* in the Consolidated Balance Sheets related to its obligation under the Funding Agreements. The liability was based on asbestos-related liabilities and insurance-related assets balances previously recorded by the Company prior to the Petition Date.

As a result of the deconsolidation, the Company recognized an aggregate loss of $24.9 million in its Consolidated Statements of Earnings during the year ended December 31, 2020. A gain of $0.9 million related to Murray and its wholly-owned subsidiary ClimateLabs was recorded within *Other income/ (expense), net* and a loss of $25.8 million related to Aldrich and its wholly-owned subsidiary 200 Park was recorded within *Discontinued operations, net of tax*. Additionally, the deconsolidation resulted in an investing cash outflow of $41.7 million in the Company's Consolidated Statements of Cash Flows, of which $10.8 million was recorded within continuing operations during the year ended December 31, 2020.

On August 26, 2021, the Company announced that Aldrich and Murray reached an agreement in principle with the court-appointed legal representative of future asbestos claimants (the FCR) in the bankruptcy proceedings. The agreement in principle includes the key terms for the permanent resolution of all current and future asbestos claims against Aldrich and Murray pursuant to a plan of reorganization (the Plan). Under the agreed terms, the Plan would create a trust pursuant to section 524(g) of the Bankruptcy Code and establish claims resolution procedures for all current and future claims against Aldrich and Murray (Asbestos Claims). On the effective date of the Plan, Aldrich and Murray would fund the trust with $545.0 million, comprised of $540.0 million in cash and a promissory note to be issued by Aldrich and Murray to the trust in the principal amount of $5.0 million, and the Asbestos Claims would be channeled to the trust for resolution in accordance with the claims resolution procedures. Following the effective date of the Plan, Aldrich and Murray would have no further obligations with respect to the Asbestos Claims. The FCR has agreed to support such Plan. The agreement in principle with the FCR is subject to final documentation and is conditioned on arrangements acceptable to Aldrich and Murray with respect to their asbestos insurance assets. It is currently contemplated that the asbestos insurance assets of Aldrich and Murray would be contributed to the trust, and that, in consideration of their cash contribution to the trust, Aldrich and Murray would have the exclusive right to pursue, collect and retain all insurance reimbursements available in connection with the resolution of Asbestos Claims by the trust. The committee representing current asbestos claimants (the ACC) is not a party to the agreement in principle. Any settlement and its implementation in a plan of reorganization is subject to the approval of the Bankruptcy Court, and there can be no assurance that the Bankruptcy Court will approve the agreement on the terms proposed.

On September 24, 2021, Aldrich and Murray filed the Plan with the Bankruptcy Court. The Plan is supported by, and reflects the agreement in principle reached with the FCR. On the same date, in connection with the Plan, Aldrich and Murray filed a motion with the Bankruptcy Court to create a $270.0 million trust intended to constitute a "qualified settlement fund" within the meaning of the Treasury Regulations under Section 468B of the Internal Revenue Code (QSF). The funds held in the QSF would be available to provide funding for the Section 524(g) Trust upon effectiveness of the Plan.

During the year ended December 31, 2021, in connection with the agreement in principle reached by Aldrich and Murray with the FCR and the motion to create a $270.0 million QSF, the Company recorded a charge of $21.2 million to increase its Funding Agreement liability to $270.0 million. The corresponding charge was bifurcated between *Other income/ (expense), net* of $7.2 million relating to Murray and discontinued operations of $14.0 million relating to Aldrich.

On January 27, 2022, the Bankruptcy Court granted the request to fund the QSF, which was funded on March 2, 2022, resulting in an operating cash outflow of $270.0 million reported in the Company's Consolidated Statements of Cash Flows, of which $91.8 million was allocated to continuing operations and $178.2 million was allocated to discontinued operations for the year ended December 31, 2022. On April 18, 2022, the Bankruptcy Court entered an order granting Aldrich and Murray's request to seek to estimate their aggregate liability for all current and future asbestos-related personal injury claims. Aldrich and Murray are pursuing discovery and related matters in connection with the estimation proceedings.

On October 18, 2021, the ACC filed a motion seeking standing to pursue and investigate on behalf of the bankruptcy estates of Aldrich and Murray, claims arising from or related to the 2020 Corporate Restructuring. Also on October 18, 2021, the ACC filed a complaint seeking to substantively consolidate the bankruptcy estates of Aldrich and Murray with certain of the Company's subsidiaries. On December 20, 2021, Aldrich, Murray and certain of the Company's subsidiaries filed motions to dismiss the ACC's substantive consolidation complaint. On April 14, 2022, the Bankruptcy Court granted the ACC's standing motion and denied the motions to dismiss the substantive consolidation complaint. On June 18, 2022, the ACC filed complaints against the Company and other related parties asserting various claims and causes of action arising from or related to the 2020 Corporate Restructuring. The Company is vigorously opposing and defending against these claims.

On April 6, 2023, certain individual claimants filed a motion to dismiss the Chapter 11 cases. Subsequently, on May 15, 2023, the ACC filed its own motion to dismiss the Chapter 11 cases. Aldrich, Murray and the FCR filed responses in opposition to each of these motions, and the Company filed papers joining in Aldrich and Murray's opposition. A hearing on the motions to dismiss was held on July 14, 2023. On December 28, 2023, the Bankruptcy Court entered an order denying the motions to dismiss the Chapter 11 cases. On January 11, 2024, the ACC and the individual claimants filed motions seeking leave to appeal the order denying the motions to dismiss and to certify the appeals directly to the Court of Appeals for the Fourth Circuit. Aldrich and Murray filed responses in opposition to these motions on January 31, 2024. It is not possible to predict how the Bankruptcy Court will rule on these pending motions, whether an appellate court will affirm or reverse the Bankruptcy Court order denying the motions to dismiss, whether the Bankruptcy Court will approve the terms of the Plan, what the extent of the asbestos liability will be or how long the Chapter 11 cases will last. The Chapter 11 cases remain pending as of February 8, 2024.

Furthermore, in connection with the 2020 Corporate Restructuring, Aldrich, Murray and their respective subsidiaries entered into several agreements with subsidiaries of the Company to ensure they each have access to services necessary for the effective operation of their respective businesses and access to capital to address any liquidity needs that arise as a result of working capital requirements or timing issues. In addition, the Company regularly transacts business with Aldrich and its wholly-owned subsidiary 200 Park and Murray and its wholly-owned subsidiary ClimateLabs. As of the Petition Date, these entities are considered related parties and post deconsolidation activity between the Company and them are reported as third party transactions and are reflected within the Company's Consolidated Statements of Earnings. Since the Petition Date, there were no material transactions between the Company and these entities other than as described above.

Environmental Matters

The Company continues to be dedicated to environmental and sustainability programs to minimize the use of natural resources, reduce the utilization and generation of hazardous materials from our manufacturing processes and remediate identified environmental concerns. As to the latter, the Company is currently engaged in site investigations and remediation activities to address environmental cleanup from past operations at current and former manufacturing facilities.

It is the Company's policy to establish environmental reserves for investigation and remediation activities when it is probable that a liability has been incurred and a reasonable estimate of the liability can be made. Estimated liabilities are determined based upon existing remediation laws and technologies. Inherent uncertainties exist in such evaluations due to unknown environmental conditions, changes in government laws and regulations, and changes in cleanup technologies. The environmental reserves are updated on a routine basis as remediation efforts progress and new information becomes available.

The Company is sometimes a party to environmental lawsuits and claims and has received notices of potential violations of environmental laws and regulations from the Environmental Protection Agency and similar state and international authorities. It has also been identified as a potentially responsible party (PRP) for cleanup costs associated with off-site waste disposal at federal Superfund and state remediation sites. In most instances at multi-party sites, the Company's share of the liability is not material.

In estimating its liability at multi-party sites, the Company has assumed it will not bear the entire cost of remediation of any site to the exclusion of other PRPs who may be jointly and severally liable. The ability of other PRPs to participate has been taken into account, based on the Company's understanding of the parties' financial condition and probable contributions on a per site basis.

Reserves for environmental matters are classified as *Accrued expenses and other current liabilities* or *Other noncurrent liabilities* based on their expected term. As of December 31, 2023 and 2022, the Company has recorded reserves for environmental matters of $47.5 million and $42.4 million, respectively. Of these amounts, $38.9 million and $36.5 million, respectively, relate to investigation and remediation of properties and multi-waste disposal sites related to businesses formerly owned by the Company.

Warranty Liability

Standard product warranty accruals are recorded at the time of sale and are estimated based upon product warranty terms and historical experience. The Company assesses the adequacy of its liabilities and will make adjustments as necessary based on known or anticipated warranty claims, or as new information becomes available.

The changes in the standard product warranty liability for the years ended December 31, were as follows:

In millions	**2023**	**2022**
Balance at beginning of period	$ 323.6	$ 296.2
Reductions for payments	(146.5)	(127.3)
Accruals for warranties issued during the current period	187.0	156.6
Changes to accruals related to preexisting warranties	9.1	1.2
Translation	0.7	(3.1)
Balance at end of period	$ 373.9	$ 323.6

Standard product warranty liabilities are classified as *Accrued expenses and other current liabilities* or *Other noncurrent liabilities* based on their expected term. The Company's total current standard product warranty reserve at December 31, 2023 and December 31, 2022 was $157.6 million and $120.4 million, respectively.

Warranty Deferred Revenue

The Company's extended warranty liability represents the deferred revenue associated with its extended warranty contracts and is amortized into *Net revenues* on a straight-line basis over the life of the contract, unless another method is more representative of the costs incurred. The Company assesses the adequacy of its liability by evaluating the expected costs under its existing contracts to ensure these expected costs do not exceed the extended warranty liability.

The changes in the extended warranty liability for the years ended December 31, were as follows:

In millions	**2023**	**2022**
Balance at beginning of period	$ 317.7	$ 311.7
Amortization of deferred revenue for the period	(118.6)	(117.4)
Additions for extended warranties issued during the period	148.6	125.1
Changes to accruals related to preexisting warranties	0.9	0.3
Translation	0.8	(2.0)
Balance at end of period	$ 349.4	$ 317.7

The extended warranty liability is classified as *Accrued expenses and other current liabilities* or *Other noncurrent liabilities* based on the timing of when the deferred revenue is expected to be amortized into *Net revenues*. The Company's total current extended warranty liability at December 31, 2023 and December 31, 2022 was $123.8 million and $110.5 million, respectively. For the years ended December 31, 2023, 2022 and 2021, the Company incurred costs of $54.3 million, $54.8 million and $58.5 million, respectively, related to extended warranties.