

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

FORM 10-Q

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

For the quarterly period ended 31 March 2020

OR

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

For the transition period from _____ to _____

Commission file number 001-04534



AIR PRODUCTS AND CHEMICALS, INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware

23-1274455

(State or Other Jurisdiction of Incorporation or Organization)

(I.R.S. Employer Identification No.)

7201 Hamilton Boulevard
Allentown, Pennsylvania 18195-1501
(Address of Principal Executive Offices and Zip Code)

610-481-4911
(Registrant's Telephone Number, Including Area Code)

Not Applicable
(Former Name, Former Address and Former Fiscal Year, if Changed Since Last Report)

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

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock, par value \$1.00 per share	APD	New York Stock Exchange
2.000% Euro Notes due 2020	APD20	New York Stock Exchange
0.375% Euro Notes due 2021	APD21B	New York Stock Exchange
1.000% Euro Notes due 2025	APD25	New York Stock Exchange

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

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

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

The number of shares of common stock, \$1 par value per share, outstanding at 31 March 2020 was 220,854,647.

AIR PRODUCTS AND CHEMICALS, INC. and Subsidiaries
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FORWARD-LOOKING STATEMENTS

This quarterly report contains “forward-looking statements” within the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include all statements that do not relate solely to historical or current facts and can generally be identified by words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “forecast,” “goal,” “intend,” “may,” “outlook,” “plan,” “positioned,” “possible,” “potential,” “project,” “should,” “target,” “will,” “would,” and similar expressions or variations thereof, or the negative thereof, but these terms are not the exclusive means of identifying such statements. Forward-looking statements are based on management’s expectations and assumptions as of the date of this report and are not guarantees of future performance. You are cautioned not to place undue reliance on our forward-looking statements.

Forward-looking statements may relate to a number of matters, including expectations regarding revenue, margins, expenses, earnings, tax provisions, cash flows, pension obligations, share repurchases or other statements regarding economic conditions or our business outlook; statements regarding plans, projects, strategies and objectives for our future operations, including our ability to win new projects and execute the projects in our backlog; and statements regarding our expectations with respect to pending legal claims or disputes. While forward-looking statements are made in good faith and based on assumptions, expectations and projections that management believes are reasonable based on currently available information, actual performance and financial results may differ materially from projections and estimates expressed in the forward-looking statements because of many factors, including, without limitation:

- the duration and impacts of the novel coronavirus (“COVID-19”) global pandemic and efforts to contain its transmission, including the effect of these factors on our business, our customers, economic conditions and markets generally;
- changes in global or regional economic conditions, supply and demand dynamics in the market segments we serve, or in the financial markets that may affect the availability and terms on which we may obtain financing;
- risks associated with having extensive international operations, including political risks, risks associated with unanticipated government actions and risks of investing in developing markets;
- project delays, contract terminations, customer cancellations, or postponement of projects and sales;
- our ability to develop and operate large scale and technically complex projects, including gasification projects;
- the future financial and operating performance of major customers and joint venture partners;
- our ability to develop, implement, and operate new technologies, or to execute the projects in our backlog;
- tariffs, economic sanctions and regulatory activities in jurisdictions in which we and our affiliates and joint ventures operate;
- the impact of environmental, tax or other legislation, as well as regulations affecting our business and related compliance requirements, including legislation or regulations related to global climate change;
- changes in tax rates and other changes in tax law;
- the timing, impact, and other uncertainties relating to acquisitions and divestitures, including our ability to integrate acquisitions and separate divested businesses, respectively;
- risks relating to cybersecurity incidents, including risks from the interruption, failure or compromise of our information systems;
- catastrophic events, such as natural disasters, acts of war, or terrorism;
- the impact on our business and customers of price fluctuations in oil and natural gas and disruptions in markets and the economy due to oil and natural gas price volatility;
- costs and outcomes of legal or regulatory proceedings and investigations;
- asset impairments due to economic conditions or specific events;
- significant fluctuations in interest rates and foreign currency exchange rates from those currently anticipated;

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- damage to facilities, pipelines or delivery systems, including those we own or operate for third parties;
- availability and cost of raw materials; and
- the success of productivity and operational improvement programs.

In addition to the foregoing factors, forward-looking statements contained herein are qualified with respect to the risks disclosed elsewhere in this document, including in Item 2, *Management's Discussion and Analysis of Financial Condition and Results of Operations*, and Item 3, *Quantitative and Qualitative Disclosures About Market Risk*, as well as with respect to the risks described in Item 1A, *Risk Factors*, to our Annual Report on Form 10-K for the year ended 30 September 2019. Any of these factors, as well as those not currently anticipated by management, could cause our results of operations, financial condition or liquidity to differ materially from what is expressed or implied by any forward-looking statement. Except as required by law, we disclaim any obligation or undertaking to update or revise any forward-looking statements contained herein to reflect any change in assumptions, beliefs, or expectations or any change in events, conditions, or circumstances upon which any such forward-looking statements are based.

PART I. FINANCIAL INFORMATION
Item 1. Consolidated Financial Statements

AIR PRODUCTS AND CHEMICALS, INC. and Subsidiaries
CONSOLIDATED INCOME STATEMENTS
(Unaudited)

	Three Months Ended 31 March		Six Months Ended 31 March	
(Millions of dollars, except for share and per share data)	2020	2019	2020	2019
Sales	\$2,216.3	\$2,187.7	\$4,471.0	\$4,411.7
Cost of sales	1,460.1	1,474.7	2,946.7	3,018.7
Facility closure	—	—	—	29.0
Selling and administrative	201.7	190.0	403.4	379.6
Research and development	19.2	16.9	36.9	31.9
Company headquarters relocation income (expense)	33.8	—	33.8	—
Other income (expense), net	8.1	10.4	20.4	19.0
Operating Income	577.2	516.5	1,138.2	971.5
Equity affiliates' income	88.2	46.2	146.4	99.1
Interest expense	19.3	35.4	38.0	72.7
Other non-operating income (expense), net	7.1	13.7	16.2	32.2
Income From Continuing Operations Before Taxes	653.2	541.0	1,262.8	1,030.1
Income tax provision	148.5	107.5	269.2	239.6
Income From Continuing Operations	504.7	433.5	993.6	790.5
Loss from discontinued operations, net of tax	(14.3)	—	(14.3)	—
Net Income	490.4	433.5	979.3	790.5
Net income attributable to noncontrolling interests of continuing operations	12.6	12.2	25.9	21.7
Net Income Attributable to Air Products	\$477.8	\$421.3	\$953.4	\$768.8
Net Income Attributable to Air Products				
Net income from continuing operations	\$492.1	\$421.3	\$967.7	\$768.8
Net loss from discontinued operations	(14.3)	—	(14.3)	—
Net Income Attributable to Air Products	\$477.8	\$421.3	\$953.4	\$768.8
Basic Earnings Per Common Share Attributable to Air Products*				
Basic earnings per share from continuing operations	\$2.22	\$1.91	\$4.38	\$3.49
Basic earnings per share from discontinued operations	(0.06)	—	(0.06)	—
Basic Earnings Per Common Share Attributable to Air Products	\$2.16	\$1.91	\$4.31	\$3.49
Diluted Earnings Per Common Share Attributable to Air Products*				
Diluted earnings per share from continuing operations	\$2.21	\$1.90	\$4.36	\$3.48
Diluted earnings per share from discontinued operations	(0.06)	—	(0.06)	—
Diluted Earnings Per Common Share Attributable to Air Products	\$2.15	\$1.90	\$4.29	\$3.48
Weighted Average Common Shares – Basic (in millions)	221.2	220.2	221.0	220.0
Weighted Average Common Shares – Diluted (in millions)	222.3	221.4	222.2	221.2

The accompanying notes are an integral part of these statements.

*Earnings per share ("EPS") is calculated independently for each component and may not sum to total EPS due to rounding.

AIR PRODUCTS AND CHEMICALS, INC. and Subsidiaries
CONSOLIDATED COMPREHENSIVE INCOME STATEMENTS
(Unaudited)

	Three Months Ended 31 March	
(Millions of dollars)	2020	2019
Net Income	\$490.4	\$433.5
Other Comprehensive Income (Loss), net of tax:		
Translation adjustments, net of tax of \$11.3 and \$8.0	(398.2)	51.3
Net gain (loss) on derivatives, net of tax of \$6.0 and (\$8.7)	(27.4)	(35.4)
Reclassification adjustments:		
Derivatives, net of tax of (\$5.0) and \$11.5	(17.0)	36.9
Pension and postretirement benefits, net of tax of \$6.5 and \$6.0	21.2	18.7
Total Other Comprehensive Income (Loss)	(421.4)	71.5
Comprehensive Income	69.0	505.0
Net Income Attributable to Noncontrolling Interests	12.6	12.2
Other Comprehensive Income (Loss) Attributable to Noncontrolling Interests	(31.8)	5.1
Comprehensive Income Attributable to Air Products	\$88.2	\$487.7

	Six Months Ended 31 March	
(Millions of dollars)	2020	2019
Net Income	\$979.3	\$790.5
Other Comprehensive Income (Loss), net of tax:		
Translation adjustments, net of tax of \$0.5 and \$12.9	(134.2)	(16.8)
Net gain (loss) on derivatives, net of tax of \$8.6 and (\$9.4)	(5.3)	(45.7)
Pension and postretirement benefits, net of tax of \$— and (\$0.8)	—	(3.9)
Reclassification adjustments:		
Derivatives, net of tax of (\$5.8) and \$10.7	(20.6)	33.8
Pension and postretirement benefits, net of tax of \$13.0 and \$11.0	40.9	33.9
Total Other Comprehensive Income (Loss)	(119.2)	1.3
Comprehensive Income	860.1	791.8
Net Income Attributable to Noncontrolling Interests	25.9	21.7
Other Comprehensive Income (Loss) Attributable to Noncontrolling Interests	(16.6)	4.2
Comprehensive Income Attributable to Air Products	\$850.8	\$765.9

The accompanying notes are an integral part of these statements.

AIR PRODUCTS AND CHEMICALS, INC. and Subsidiaries
CONSOLIDATED BALANCE SHEETS
(Unaudited)

	31 March 2020	30 September 2019
(Millions of dollars, except for share and per share data)		
Assets		
Current Assets		
Cash and cash items	\$2,220.1	\$2,248.7
Short-term investments	—	166.0
Trade receivables, net	1,399.4	1,260.2
Inventories	399.7	388.3
Prepaid expenses	129.6	77.4
Other receivables and current assets	539.7	477.7
Total Current Assets	4,688.5	4,618.3
Investment in net assets of and advances to equity affiliates	1,314.6	1,276.2
Plant and equipment, at cost	23,005.2	22,333.7
Less: accumulated depreciation	12,381.5	11,996.1
Plant and equipment, net	10,623.7	10,337.6
Goodwill, net	785.3	797.1
Intangible assets, net	377.9	419.5
Noncurrent lease receivables	840.8	890.0
Other noncurrent assets	870.4	604.1
Total Noncurrent Assets	14,812.7	14,324.5
Total Assets	\$19,501.2	\$18,942.8
Liabilities and Equity		
Current Liabilities		
Payables and accrued liabilities	\$1,649.1	\$1,635.7
Accrued income taxes	90.4	86.6
Short-term borrowings	29.0	58.2
Current portion of long-term debt	38.4	40.4
Total Current Liabilities	1,806.9	1,820.9
Long-term debt	2,922.1	2,907.3
Long-term debt – related party	323.1	320.1
Other noncurrent liabilities	1,881.0	1,712.4
Deferred income taxes	844.4	793.8
Total Noncurrent Liabilities	5,970.6	5,733.6
Total Liabilities	7,777.5	7,554.5
Commitments and Contingencies - See Note 13		
Air Products Shareholders' Equity		
Common stock (par value \$1 per share; issued 2020 and 2019 - 249,455,584 shares)	249.4	249.4
Capital in excess of par value	1,074.6	1,070.9
Retained earnings	14,537.2	14,138.4
Accumulated other comprehensive loss	(2,478.2)	(2,375.6)
Treasury stock, at cost (2020 - 28,600,937 shares; 2019 - 29,040,322 shares)	(2,011.1)	(2,029.5)
Total Air Products Shareholders' Equity	11,371.9	11,053.6
Noncontrolling Interests	351.8	334.7
Total Equity	11,723.7	11,388.3
Total Liabilities and Equity	\$19,501.2	\$18,942.8

The accompanying notes are an integral part of these statements.

AIR PRODUCTS AND CHEMICALS, INC. and Subsidiaries
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited)

	Six Months Ended 31 March	
(Millions of dollars)	2020	2019
Operating Activities		
Net income	\$979.3	\$790.5
Less: Net income attributable to noncontrolling interests of continuing operations	25.9	21.7
Net income attributable to Air Products	953.4	768.8
Loss from discontinued operations	14.3	—
Income from continuing operations attributable to Air Products	967.7	768.8
Adjustments to reconcile income to cash provided by operating activities:		
Depreciation and amortization	583.9	520.1
Deferred income taxes	55.0	27.5
Tax reform repatriation	—	46.2
Facility closure	—	29.0
Undistributed (earnings) losses of unconsolidated affiliates	(101.6)	(27.2)
Gain on sale of assets and investments	(40.5)	(2.3)
Share-based compensation	26.9	21.2
Noncurrent lease receivables	47.1	47.6
Other adjustments	54.0	(3.5)
Working capital changes that provided (used) cash, excluding effects of acquisitions:		
Trade receivables	(111.9)	(55.4)
Inventories	(16.5)	(14.2)
Other receivables	(0.7)	49.6
Payables and accrued liabilities	(111.8)	(125.5)
Other working capital	(113.1)	3.9
Cash Provided by Operating Activities	1,238.5	1,285.8
Investing Activities		
Additions to plant and equipment	(930.6)	(963.5)
Acquisitions, less cash acquired	—	(106.3)
Investment in and advances to unconsolidated affiliates	(22.7)	(1.4)
Proceeds from sale of assets and investments	68.0	3.8
Purchases of investments	—	(5.3)
Proceeds from investments	177.0	187.9
Other investing activities	1.9	2.7
Cash Used for Investing Activities	(706.4)	(882.1)
Financing Activities		
Payments on long-term debt	(3.4)	(2.7)
Net decrease in commercial paper and short-term borrowings	(33.3)	(6.6)
Dividends paid to shareholders	(511.7)	(483.1)
Proceeds from stock option exercises	20.2	45.4
Other financing activities	(9.6)	(12.8)
Cash Used for Financing Activities	(537.8)	(459.8)
Effect of Exchange Rate Changes on Cash	(22.9)	0.7
Decrease in cash and cash items	(28.6)	(55.4)
Cash and cash items – Beginning of Year	2,248.7	2,791.3
Cash and Cash Items – End of Period	\$2,220.1	\$2,735.9

The accompanying notes are an integral part of these statements.

AIR PRODUCTS AND CHEMICALS, INC. and Subsidiaries
CONSOLIDATED STATEMENTS OF EQUITY
(Unaudited)

Six Months Ended

31 March 2020

(Millions of dollars, except for per share data)	Common Stock	Capital in Excess of Par Value	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Treasury Stock	Air Products Shareholders' Equity	Non- controlling Interests	Total Equity
Balance at 30 September 2019	\$249.4	\$1,070.9	\$14,138.4	(\$2,375.6)	(\$2,029.5)	\$11,053.6	\$334.7	\$11,388.3
Net income	—	—	953.4	—	—	953.4	25.9	979.3
Other comprehensive income (loss)	—	—	—	(102.6)	—	(102.6)	(16.6)	(119.2)
Dividends on common stock (per share \$2.50)	—	—	(551.9)	—	—	(551.9)	—	(551.9)
Dividends to noncontrolling interests	—	—	—	—	—	—	(4.4)	(4.4)
Share-based compensation	—	24.6	—	—	—	24.6	—	24.6
Issuance of treasury shares for stock option and award plans	—	(16.2)	—	—	18.4	2.2	—	2.2
Investments by noncontrolling interests	—	—	—	—	—	—	11.9	11.9
Other equity transactions	—	(4.7)	(2.7)	—	—	(7.4)	0.3	(7.1)
Balance at 31 March 2020	\$249.4	\$1,074.6	\$14,537.2	(\$2,478.2)	(\$2,011.1)	\$11,371.9	\$351.8	\$11,723.7

Six Months Ended

31 March 2019

(Millions of dollars, except for per share data)	Common Stock	Capital in Excess of Par Value	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Treasury Stock	Air Products Shareholders' Equity	Non- controlling Interests	Total Equity
Balance at 30 September 2018	\$249.4	\$1,029.3	\$13,409.9	(\$1,741.9)	(\$2,089.2)	\$10,857.5	\$318.8	\$11,176.3
Net income	—	—	768.8	—	—	768.8	21.7	790.5
Other comprehensive income (loss)	—	—	—	(2.9)	—	(2.9)	4.2	1.3
Dividends on common stock (per share \$2.26)	—	—	(497.5)	—	—	(497.5)	—	(497.5)
Dividends to noncontrolling interests	—	—	—	—	—	—	(7.0)	(7.0)
Share-based compensation	—	20.7	—	—	—	20.7	—	20.7
Issuance of treasury shares for stock option and award plans	—	(0.9)	—	—	40.6	39.7	—	39.7
Cumulative change in accounting principle	—	—	(17.1)	—	—	(17.1)	—	(17.1)
Other equity transactions	—	(1.4)	(2.1)	—	—	(3.5)	—	(3.5)
Balance at 31 March 2019	\$249.4	\$1,047.7	\$13,662.0	(\$1,744.8)	(\$2,048.6)	\$11,165.7	\$337.7	\$11,503.4

The accompanying notes are an integral part of these statements.

AIR PRODUCTS AND CHEMICALS, INC. and Subsidiaries
CONSOLIDATED STATEMENTS OF EQUITY (cont.)
(Unaudited)

Three Months Ended

31 March 2020

(Millions of dollars, except for per share data)	Common Stock	Capital in Excess of Par Value	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Treasury Stock	Air Products Shareholders' Equity	Non-controlling Interests	Total Equity
Balance at 31 December 2019	\$249.4	\$1,061.7	\$14,356.9	(\$2,088.6)	(\$2,023.4)	\$11,556.0	\$373.8	\$11,929.8
Net income	—	—	477.8	—	—	477.8	12.6	490.4
Other comprehensive income (loss)	—	—	—	(389.6)	—	(389.6)	(31.8)	(421.4)
Dividends on common stock (per share \$1.34)	—	—	(295.9)	—	—	(295.9)	—	(295.9)
Dividends to noncontrolling interests	—	—	—	—	—	—	(3.1)	(3.1)
Share-based compensation	—	10.7	—	—	—	10.7	—	10.7
Issuance of treasury shares for stock option and award plans	—	2.3	—	—	12.3	14.6	—	14.6
Other equity transactions	—	(0.1)	(1.6)	—	—	(1.7)	0.3	(1.4)
Balance at 31 March 2020	\$249.4	\$1,074.6	\$14,537.2	(\$2,478.2)	(\$2,011.1)	\$11,371.9	\$351.8	\$11,723.7

Three Months Ended

31 March 2019

(Millions of dollars, except for per share data)	Common Stock	Capital in Excess of Par Value	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Treasury Stock	Air Products Shareholders' Equity	Non-controlling Interests	Total Equity
Balance at 31 December 2018	\$249.4	\$1,030.4	\$13,497.9	(\$1,811.2)	(\$2,083.6)	\$10,882.9	\$320.5	\$11,203.4
Net income	—	—	421.3	—	—	421.3	12.2	433.5
Other comprehensive income (loss)	—	—	—	66.4	—	66.4	5.1	71.5
Dividends on common stock (per share \$1.16)	—	—	(255.9)	—	—	(255.9)	—	(255.9)
Dividends to noncontrolling interests	—	—	—	—	—	—	(0.1)	(0.1)
Share-based compensation	—	11.8	—	—	—	11.8	—	11.8
Issuance of treasury shares for stock option and award plans	—	6.7	—	—	35.0	41.7	—	41.7
Other equity transactions	—	(1.2)	(1.3)	—	—	(2.5)	—	(2.5)
Balance at 31 March 2019	\$249.4	\$1,047.7	\$13,662.0	(\$1,744.8)	(\$2,048.6)	\$11,165.7	\$337.7	\$11,503.4

The accompanying notes are an integral part of these statements.

AIR PRODUCTS AND CHEMICALS, INC. and Subsidiaries
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

(Millions of dollars unless otherwise indicated, except for share and per share data)

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1. BASIS OF PRESENTATION AND MAJOR ACCOUNTING POLICIES

The interim consolidated financial statements of Air Products and Chemicals, Inc. and its subsidiaries ("we," "our," "us," the "Company," "Air Products," or "registrant") included herein have been prepared by us, without audit, pursuant to the rules and regulations of the Securities and Exchange Commission (the "SEC"). Certain information and footnote disclosures normally included in financial statements prepared in accordance with U.S. generally accepted accounting principles ("GAAP") have been condensed or omitted pursuant to such rules and regulations. In our opinion, the accompanying statements reflect adjustments necessary to present fairly the financial position, results of operations, and cash flows for those periods indicated and contain adequate disclosures to make the information presented not misleading. Adjustments included herein are of a normal, recurring nature unless otherwise disclosed in the notes. The notes to the interim consolidated financial statements, unless otherwise indicated, are on a continuing operations basis.

To fully understand the basis of presentation, the consolidated financial statements and related notes included herein should be read in conjunction with the consolidated financial statements and notes thereto included in our Annual Report on Form 10-K for the year ended 30 September 2019 (the "2019 Form 10-K"). Results of operations for interim periods are not necessarily indicative of the results of operations for a full year.

Refer to our 2019 Form 10-K for a description of major accounting policies. In fiscal year 2020, these policies were impacted by the implementation of certain new accounting guidance, including the adoption of Accounting Standards Codification ("ASC") Topic 842, *Leases*, and all related amendments (the "new lease standard"). We adopted the new lease standard as of 1 October 2019 under the modified retrospective approach. Comparative prior year information has not been restated and continues to be reported under the accounting standards in effect for those periods. Our updated lease policy is discussed below.

Other than the adoption of new accounting guidance as discussed in Note 2, *New Accounting Guidance*, and presentation changes discussed below, there were no notable changes to our accounting policies during the first six months of fiscal year 2020.

Leases

As lessee, we recognize a right-of-use ("ROU") asset and lease liability on the balance sheet for all leases with a term in excess of 12 months. We determine if an arrangement contains a lease at inception. The arrangement contains a lease when there is an identifiable asset, we obtain substantially all of the economic benefits from that asset, and we direct how and for what purpose the asset is used during the term of the arrangement. If the initial term of an arrangement is 12 months or less, we have made an accounting election to not assess if these arrangements contain a lease for inclusion on our balance sheet.

ROU assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. ROU assets and lease liabilities are recognized at the commencement date based on the present value of lease payments over the lease term. Since our leases generally do not provide an implicit discount rate, we use our incremental borrowing rates based on the information available at the commencement date in determining the present value of lease payments. To determine the incremental borrowing rate, we consider our unsecured borrowings and published market rates, and then adjust those rates to assume full collateralization and to factor in the individual lease term, geography, and payment structure.

Our lease term includes periods covered by options to extend or terminate the lease when it is reasonably certain that we will exercise an option to extend or not exercise an option to terminate. Lease payments consider our practical expedient to combine amounts for lease and related non-lease components for all classes of underlying assets in which we are lessee. Fixed payments and payments associated with escalation clauses based on an index are included in the ROU asset and lease liability at commencement. Variable lease payments are excluded from the ROU assets and lease liabilities and are recognized in the period in which the obligation for those payments is incurred. Our variable lease payments primarily include the impact from escalation clauses that are not fixed or based on an index. Prepaid lease payments are included in the recognition of ROU assets. Our lease agreements do not contain any material lease incentives, residual value guarantees or restrictions or covenants.

Foreign Currency

As further discussed in Note 2, *New Accounting Guidance*, we adopted new accounting guidance on hedging activities in fiscal year 2020 that changed the income statement presentation of excluded components (foreign currency forward points and currency swap basis differences) of our cash flow hedges of intercompany loans. This activity is now amortized on a straight-line basis within "Other non-operating income (expense), net" instead of being recognized in "Interest expense." In addition, gains and losses from the foreign currency remeasurement of balances associated with intercompany and third-party financing transactions, related income tax assets and liabilities, and the impact of related hedges are now also reflected within "Other non-operating income (expense), net." All other gains and losses from foreign currency transactions continue to be reflected within "Other income (expense), net" on our consolidated income statements. Comparative prior year information has not been restated.

COVID-19 Risks and Uncertainties

In March 2020, the World Health Organization declared the novel strain of coronavirus ("COVID-19") a global pandemic and recommended containment and mitigation measures worldwide. The Company is monitoring this, and although operations have not been materially affected by the COVID-19 outbreak as of and for the three and six months ended 31 March 2020, we are unable to predict the impact that COVID-19 will have on our future financial position and operating results due to numerous uncertainties. The duration and severity of the outbreak and its long-term impact on our business are uncertain at this time.

2. NEW ACCOUNTING GUIDANCE

Accounting Guidance Implemented in Fiscal Year 2020

Leases

In February 2016, the FASB issued lease guidance (the "new lease guidance") that requires lessees to recognize a right-of-use asset and lease liability on the balance sheet for all leases, including operating leases, with a term in excess of 12 months. The guidance also expands the quantitative and qualitative disclosure requirements.

The Company is the lessee under various agreements for real estate, vehicles, aircraft, and other equipment that are accounted for as operating leases.

We adopted this guidance in fiscal year 2020 using a modified retrospective approach with the election to apply the guidance as of 1 October 2019, "the adoption date," instead of the earliest comparative period presented in the consolidated financial statements.

We elected the following practical expedients provided by this guidance:

- The package of practical expedients, which allows us to carry forward the lease population and classification existing as of the adoption date, among other things;
- The land easements practical expedient, which allows us to carry forward our accounting treatment for land easements on agreements existing before the adoption date;
- The hindsight practical expedient, which is used to determine the reasonably certain lease term for existing leases as of the adoption date;
- The component combination practical expedient, which allows us to account for lease and non-lease components associated with that lease as a single component, if certain criteria are met; and
- The short-term leases practical expedient, which allows us to not record the related lease liabilities and right-of-use assets for operating leases in which we are the lessee with a term of 12 months or less.

Adoption of the standard resulted in recognition of lease liabilities and right-of-use assets on our consolidated balance sheets of \$375.3 and \$332.3, respectively. The standard did not materially affect our retained earnings, results of operations or liquidity. Refer to Note 9, *Leases*, for additional information.

Hedging Activities

In August 2017, the FASB issued guidance on hedging activities to expand the related presentation and disclosure requirements, change how companies assess effectiveness, and eliminate the separate measurement and reporting of hedge ineffectiveness. The guidance also enables more hedging strategies to become eligible for hedge accounting.

We adopted the new guidance on 1 October 2019 on a modified retrospective basis. The primary impact of adoption was the presentation in the consolidated income statement of foreign currency forward points and currency swap basis differences ("excluded components"), since these are excluded from the assessment of hedge effectiveness for our hedges of intercompany loans. Historically, the impacts from changes in value of these components were recorded in "Interest expense." Beginning in fiscal year 2020, the excluded components were recognized in "Other non-operating income (expense), net" consistent with the remeasurement of the intercompany loans. During the three and six months ended 31 March 2020, we recognized \$8.5 and \$17.4, respectively, in "Other non-operating income (expense), net." During the three and six months ended 31 March 2019, we recognized \$9.1 and \$17.4, respectively, in "Interest expense."

In accordance with the transition provisions of the guidance, the separate measurement of ineffectiveness for our cash flow hedging instruments existing as of the date of adoption should be eliminated through a cumulative-effect adjustment within equity. Ineffectiveness recognized for our cash flow hedging instruments existing as of the date of adoption was not material to the consolidated financial statements.

New Accounting Guidance to be Implemented

Credit Losses on Financial Instruments

In June 2016, the FASB issued guidance on the measurement of credit losses, which requires measurement and recognition of expected credit losses for financial assets, including trade receivables and capital lease receivables, held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. The method to determine a loss is different from the existing guidance, which requires a credit loss to be recognized when it is probable. The guidance is effective beginning in fiscal year 2021, with early adoption permitted beginning in fiscal year 2020. We are currently evaluating the impact this guidance will have on our consolidated financial statements.

Fair Value Measurement Disclosures

In August 2018, the FASB issued guidance which modifies the disclosure requirements for fair value measurements. The guidance is effective in fiscal year 2021, with early adoption permitted. Certain amendments must be applied prospectively and other amendments retrospectively. We are currently evaluating the impact this guidance will have on disclosures in the notes to our consolidated financial statements.

Retirement Benefit Disclosures

In August 2018, the FASB issued guidance which modifies the disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. The guidance is effective in fiscal year 2021, with early adoption permitted, and must be applied on a retrospective basis. We expect to adopt this guidance in the fourth quarter of fiscal year 2020 and update the disclosures contained in our annual report on Form 10-K accordingly. Other than the modification of certain disclosures, this guidance will have no effect on our consolidated financial statements.

Cloud Computing Implementation Costs

In August 2018, the FASB issued guidance which aligns the capitalization requirements for implementation costs incurred in a hosting arrangement that is a service contract with the existing capitalization requirements for implementation costs incurred to develop or obtain internal-use software. The guidance is effective in fiscal year 2021, with early adoption permitted, and may be applied either prospectively or retrospectively. We are currently evaluating the impact this guidance will have on our consolidated financial statements.

Related Party Guidance for Variable Interest Entities

In October 2018, the FASB issued an update which amends the guidance for determining whether a decision-making fee is a variable interest. The amendments require consideration of indirect interests held through related parties under common control on a proportional basis rather than as the equivalent of a direct interest in its entirety as currently required. The guidance is effective in fiscal year 2021, with early adoption permitted. The amendments must be applied retrospectively with a cumulative-effect adjustment to retained earnings at the beginning of the earliest period presented. We are currently evaluating the impact this guidance will have on our consolidated financial statements.

Simplifying the Accounting for Income Taxes

In December 2019, the FASB issued an update to simplify the accounting for income taxes and improve consistent application by clarifying or amending existing guidance. This guidance is effective in fiscal year 2022, with early adoption permitted. Depending on the provision, application can be made on a prospective, retrospective, or on a modified retrospective basis. We do not expect this guidance to have a material impact on our consolidated financial statements upon adoption.

Reference Rate Reform

In March 2020, the FASB issued an update to provide practical expedients and exception for applying U.S. GAAP to contracts, hedging relationships and other transactions affected by reference rate reform if certain criteria are met. This update is primarily applicable to our contracts and hedging relationships that reference LIBOR. The amendments may be applied to impacted contracts and hedges prospectively through 31 December 2022. We are currently evaluating the impact this guidance will have on our consolidated financial statements.

3. REVENUE RECOGNITION

The majority of the Company's revenue is generated from its sale of gas customers within its Industrial Gases regional segments. We distribute gases through either our on-site or merchant supply mode depending on various factors, including the customer's volume requirements and location. The Industrial Gases – Global and the Corporate and other segments serve our sale of equipment customers.

Disaggregation of Revenue

The tables below present our consolidated sales disaggregated by supply mode for each of our reporting segments for the three and six months ended 31 March 2020 and 2019. We believe this presentation best depicts the nature, timing, type of customer, and contract terms for our sales.

	Industrial Gases— Americas	Industrial Gases— EMEA	Industrial Gases— Asia	Industrial Gases— Global	Corporate and other	Total	%
Three Months Ended 31 March 2020							
On-site	\$516.2	\$160.3	\$425.6	\$—	\$—	\$1,102.1	50%
Merchant	416.2	332.4	232.5	—	—	981.1	44%
Sale of Equipment	—	—	—	79.3	53.8	133.1	6%
Total	\$932.4	\$492.7	\$658.1	\$79.3	\$53.8	\$2,216.3	100%
Three Months Ended 31 March 2019							
On-site	\$580.9	\$178.6	\$386.0	\$—	\$—	\$1,145.5	52%
Merchant	410.8	315.8	239.4	—	—	966.0	44%
Sale of Equipment	—	—	—	53.8	22.4	76.2	4%
Total	\$991.7	\$494.4	\$625.4	\$53.8	\$22.4	\$2,187.7	100%
	Industrial Gases— Americas	Industrial Gases— EMEA	Industrial Gases— Asia	Industrial Gases— Global	Corporate and other	Total	%
Six Months Ended 31 March 2020							
On-site	\$1,050.7	\$331.7	\$843.9	\$—	\$—	\$2,226.3	50%
Merchant	817.9	659.7	507.0	—	—	1,984.6	44%
Sale of Equipment	—	—	—	171.9	88.2	260.1	6%
Total	\$1,868.6	\$991.4	\$1,350.9	\$171.9	\$88.2	\$4,471.0	100%
Six Months Ended 31 March 2019							
On-site	\$1,176.9	\$400.8	\$767.0	\$—	\$—	\$2,344.7	53%
Merchant	804.0	617.8	485.2	—	—	1,907.0	43%
Sale of Equipment	—	—	—	122.0	38.0	160.0	4%
Total	\$1,980.9	\$1,018.6	\$1,252.2	\$122.0	\$38.0	\$4,411.7	100%

Remaining Performance Obligations

As of 31 March 2020, the transaction price allocated to remaining performance obligations is estimated to be approximately \$20 billion. This amount includes fixed-charge contract provisions associated with our on-site and sale of equipment supply modes. We estimate that approximately half of this revenue will be recognized over approximately the next five years and the balance thereafter.

Expected revenue associated with new on-site plants that are not yet onstream is excluded from this amount. In addition, this amount excludes consideration associated with contracts having an expected duration of less than one year and variable consideration for which we recognize revenue at the amount to which we have the right to invoice, including pass-through costs related to energy and natural gas.

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In the future, actual amounts will differ due to events outside of our control, including but not limited to inflationary price escalations, currency exchange rates, and terminated or renewed contracts.

Contract Balances

The table below details balances arising from contracts with customers:

	Balance Sheet Location	31 March 2020	30 September 2019
Assets			
Contract assets – current	Other receivables and current assets	\$84.2	\$64.3
Contract fulfillment costs – current	Other receivables and current assets	84.8	64.5
Liabilities			
Contract liabilities – current	Payables and accrued liabilities	284.1	247.4
Contract liabilities – noncurrent	Other noncurrent liabilities	51.2	49.2

Changes to our contract balances primarily relate to our sale of equipment contracts. During the six months ended 31 March 2020, we recognized approximately \$95 in revenue associated with sale of equipment contracts that was included within our contract liabilities as of 30 September 2019.

4. DISCONTINUED OPERATIONS

Our consolidated income statements for the three and six months ended 31 March 2020 include a pre-tax loss from discontinued operations of \$19.0 (\$14.3 after-tax). We recorded this loss to increase our existing liability for retained environmental obligations associated with the sale of our former Amines business in September 2006. Refer to the Pace discussion within Note 13, *Commitments and Contingencies*, for additional information. The loss did not have an impact on our statement of cash flows for the six months ended March 31, 2020.

5. COST REDUCTION ACTIONS

In fiscal year 2019, we recognized an expense of \$25.5 for severance and other benefits associated with the elimination or planned elimination of approximately 300 positions. These actions were taken to drive cost synergies primarily within the Industrial Gases – EMEA and the Industrial Gases – Americas segments. The charge was not recorded in segment results.

Liabilities associated with these actions are reflected on our consolidated balance sheets within "Payables and accrued liabilities." The table below summarizes the carrying amount of the accrual as of 31 March 2020:

2019 Charge	\$25.5
Cash expenditures	(6.9)
Amount reflected in pension liability	(0.3)
Currency translation adjustment	(0.5)
30 September 2019	\$17.8
Cash expenditures	(7.8)
Currency translation adjustment	0.2
31 March 2020	\$10.2

6. ACQUISITIONS

During the second quarter of fiscal year 2019, we acquired ACP Europe SA, the largest independent carbon dioxide business in Continental Europe, for an aggregate purchase price, net of cash acquired, of \$106.3. The results of this business are consolidated within our Industrial Gases – EMEA segment.

Subsequent Event

On 17 April 2020, Air Products acquired five operating hydrogen production plants from PBF Energy Inc. for \$530 and has commenced the long-term supply of hydrogen from those plants to PBF refineries.

7. INVENTORIES

The components of inventories are as follows:

	31 March 2020	30 September 2019
Finished goods	\$131.2	\$128.8
Work in process	28.5	27.5
Raw materials, supplies and other	240.0	232.0
Inventories	\$399.7	\$388.3

8. GOODWILL

Changes to the carrying amount of consolidated goodwill by segment for the six months ended 31 March 2020 are as follows:

	Industrial Gases— Americas	Industrial Gases— EMEA	Industrial Gases— Asia	Industrial Gases— Global	Corporate and other	Total
Goodwill, net at 30 September 2019	\$156.3	\$432.3	\$178.5	\$19.6	\$10.4	\$797.1
Currency translation and other	(7.8)	(2.0)	(1.5)	(0.5)	—	(11.8)
Goodwill, net at 31 March 2020	\$148.5	\$430.3	\$177.0	\$19.1	\$10.4	\$785.3

	31 March 2020	30 September 2019
Goodwill, gross	\$1,095.9	\$1,162.2
Accumulated impairment losses ^(A)	(310.6)	(365.1)
Goodwill, net	\$785.3	\$797.1

^(A) Accumulated impairment losses include the impacts of currency translation. These losses are attributable to our Latin America reporting unit ("LASA") within the Industrial Gases – Americas segment.

We review goodwill for impairment annually in the fourth quarter of the fiscal year and whenever events or changes in circumstances indicate that the carrying value of goodwill might not be recoverable.

9. LEASES

As discussed in Note 2, *New Accounting Guidance*, we adopted the new lease guidance in fiscal year 2020 using a modified retrospective approach with the election to apply the guidance as of 1 October 2019. For adoption, we elected the package of practical expedients permitted under the transition guidance to carry forward the historical lease populations as well as their classifications existing as of the adoption date (i.e. contracts having a lease commencement date prior to 1 October 2019). Refer to Note 1, *Basis of Presentation and Major Accounting Policies*, and Note 2, *New Accounting Guidance*, for additional information on our adoption and related policies under the new lease standard.

Lessee Accounting

The Company is the lessee under various agreements for real estate, vehicles, aircraft, and other equipment that are accounted for as operating leases. Our finance leases principally relate to the right to use machinery and equipment and are not material.

The operating lease expense for the three and six months ended 31 March 2020, which exclude short-term and variable lease expenses, as those expenses are immaterial, was \$20.1 and \$39.5, respectively.

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Amounts associated with operating leases, including their presentation on our consolidated balance sheets, as of our most recent balance sheet date and our adoption date are as follows:

	31 March 2020	1 October 2019
Operating lease ROU asset		
Other noncurrent assets	\$351.1	\$332.3
Operating lease liabilities		
Payables and accrued liabilities	67.2	68.6
Other noncurrent liabilities	326.2	306.7
Total Operating Lease Liabilities	\$393.4	\$375.3

The difference between the ROU assets and lease liabilities recorded upon adoption primarily relate to the land lease associated with our former Energy-from-Waste business in which an ROU asset was not recognized.

	31 March 2020
Weighted-average remaining lease term (in years) ^(A)	15.4
Weighted-average discount rate ^(B)	2.2%

^(A) Calculated on the basis of the remaining lease term and the lease liability balance for each lease as of the reporting date.

^(B) Calculated on the basis of the discount rate used to calculate the lease liability for each lease as of the reporting date and the remaining balance of the lease payments for each lease as of the reporting date.

At 31 March 2020, the maturity analysis of lease liabilities, showing the undiscounted cash flows, is as follows:

	Operating Leases
2020 (excluding the six months ended 31 March 2020)	\$39.2
2021	66.4
2022	48.3
2023	40.6
2024	33.2
Thereafter	232.0
Total Undiscounted Lease Payments	\$459.7
Imputed interest	(66.3)
Present Value of Lease Liability Recognized on the Balance Sheet	\$393.4

As previously disclosed in our 2019 Form 10-K, at 30 September 2019, prior to our adoption of the new lease guidance, minimum payments due under leases were as follows:

	Operating Leases
2020	\$75.1
2021	62.6
2022	44.4
2023	35.9
2024	28.6
Thereafter	171.4
Total Undiscounted Lease Payments	\$418.0

The impacts associated with our operating leases on the consolidated statements of cash flows are reflected within "Other adjustments" within operating activities. This includes the non-cash impact from operating lease costs of \$39.5 as well as a use of cash of \$39.1 for payments on amounts included in the measurement of the lease liability. The net impact to operating cash flows from these activities is not material.

In addition to the ROU assets established upon adoption, we recorded \$70 of non-cash additions during the six months ended 31 March 2020.

Lessor Accounting

Historically, certain contracts associated with facilities that are built to provide product to a specific customer were accounted for as leases. As noted above, we elected the package of practical expedients permitted under the transition guidance to carry forward these lease determinations as of 30 September 2019.

In cases where operating lease treatment is appropriate, there is no difference in revenue recognition over the life of the contract as compared to accounting for the contract under a sale of gas agreement. Under the new lease standard, these contracts qualify for a practical expedient available to lessors to combine the lease and non-lease components and account for the combined component in accordance with the accounting treatment for the predominant component. We elected to apply this practical expedient and have accounted for the combined component as product sales under the revenue standard as we control the operations and maintenance of the assets that provide the supply of gas to our customers.

In cases where sales-type lease treatment is appropriate, revenue and expense are recognized up front for the sale of equipment component of the contract as compared to revenue recognition over the life of the arrangement under contracts not qualifying as sales-type leases. Additionally, a portion of the revenue representing interest income from the financing component of the lease receivable is reflected as sales over the life of the contract. During the six months ended 31 March 2020, we recognized interest income of \$36.4 on our lease receivables. As we generally control the operations and maintenance of the assets that provide the supply of gas to our customers, we do not expect new arrangements to qualify as leases.

Our contracts generally do not have the option to extend or terminate the lease or provide the customer the right to purchase the asset at the end of the contract term. Instead, renewal of such contracts requires negotiation of mutually agreed terms by both parties. Unless the customer terminates within the required notice period, the contract will go into evergreen. Given the long-term duration of our contracts, there is no assumed residual value for the assets at the end of the lease term.

Lease receivables, net, primarily relate to sales-type leases and are mostly included within "Noncurrent lease receivables" on our consolidated balance sheets, with the remaining balance in "Other receivables and current assets."

Lease payments collected during the six months ended 31 March 2020 were \$83.5. These payments reduced the lease receivable balance by \$47.1 in fiscal year 2020.

At 31 March 2020, minimum lease payments expected to be collected, which reconciles to the total undiscounted minimum lease payments reflected in the table below, were as follows:

2020 (excluding the six months ended 31 March 2020)	\$79.7
2021	155.4
2022	144.7
2023	138.6
2024	132.6
Thereafter	715.7
Total	\$1,366.7
Unearned interest income	(436.1)
Lease Receivables, net	\$930.6

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As previously disclosed in our 2019 Form 10-K, at 30 September 2019, prior to our adoption of the new lease guidance, minimum lease payments expected to be collected were as follows:

2020	\$162.5
2021	156.9
2022	145.7
2023	139.4
2024	133.2
Thereafter	715.5
Total	\$1,453.2
Unearned interest income	(472.3)
Lease Receivables, net	\$980.9

Other than lease payments received during the first six months of fiscal year 2020 and the impact of currency, there have been no significant changes to our minimum lease payments expected to be collected since those disclosed as of 30 September 2019 in our 2019 Form 10-K.

10. FINANCIAL INSTRUMENTS

Currency Price Risk Management

Our earnings, cash flows, and financial position are exposed to foreign currency risk from foreign currency-denominated transactions and net investments in foreign operations. It is our policy to seek to minimize our cash flow volatility from changes in currency exchange rates. This is accomplished by identifying and evaluating the risk that our cash flows will change in value due to changes in exchange rates and by executing strategies necessary to manage such exposures. Our objective is to maintain economically balanced currency risk management strategies that provide adequate downside protection.

Forward Exchange Contracts

We enter into forward exchange contracts to reduce the cash flow exposure to foreign currency fluctuations associated with highly anticipated cash flows and certain firm commitments, such as the purchase of plant and equipment. We also enter into forward exchange contracts to hedge the cash flow exposure on intercompany loans. This portfolio of forward exchange contracts consists primarily of Euros and U.S. Dollars. The maximum remaining term of any forward exchange contract currently outstanding and designated as a cash flow hedge at 31 March 2020 is 3.2 years.

Forward exchange contracts are also used to hedge the value of investments in certain foreign subsidiaries and affiliates by creating a liability in a currency in which we have a net equity position. The primary currency pair in this portfolio of forward exchange contracts is Euros and U.S. Dollars.

We also utilize forward exchange contracts that are not designated as hedges. These contracts are used to economically hedge foreign currency-denominated monetary assets and liabilities, primarily working capital. The primary objective of these forward exchange contracts is to protect the value of foreign currency-denominated monetary assets and liabilities from the effects of volatility in foreign exchange rates that might occur prior to their receipt or settlement. This portfolio of forward exchange contracts consists of many different foreign currency pairs, with a profile that changes from time to time depending on business activity and sourcing decisions.

The table below summarizes our outstanding currency price risk management instruments:

	31 March 2020		30 September 2019	
	US\$ Notional	Years Average Maturity	US\$ Notional	Years Average Maturity
Forward Exchange Contracts:				
Cash flow hedges	\$2,682.9	0.4	\$2,418.2	0.5
Net investment hedges	450.0	1.6	830.8	0.9
Not designated	1,342.3	0.5	1,053.5	0.6
Total Forward Exchange Contracts	\$4,475.2	0.6	\$4,302.5	0.6

We also use foreign currency-denominated debt to hedge the foreign currency exposures of our net investment in certain foreign subsidiaries. The designated foreign currency-denominated debt and related accrued interest was €938.8 million (\$1,036.1) at 31 March 2020 and €951.3 million (\$1,036.9) at 30 September 2019. The designated foreign currency-denominated debt is presented within "Long-term debt" on the consolidated balance sheets.

Debt Portfolio Management

It is our policy to identify, on a continuing basis, the need for debt capital and to evaluate the financial risks inherent in funding the Company with debt capital. Reflecting the result of this ongoing review, our debt portfolio and hedging program are managed with the intent to (1) reduce funding risk with respect to borrowings made by us to preserve our access to debt capital and provide debt capital as required for funding and liquidity purposes, and (2) manage the aggregate interest rate risk and the debt portfolio in accordance with certain debt management parameters.

Interest Rate Management Contracts

We enter into interest rate swaps to change the fixed/variable interest rate mix of our debt portfolio in order to maintain the percentage of fixed- and variable-rate debt within the parameters set by management. In accordance with these parameters, the agreements are used to manage interest rate risks and costs inherent in our debt portfolio. Our interest rate management portfolio generally consists of fixed-to-floating interest rate swaps (which are designated as fair value hedges), pre-issuance interest rate swaps and treasury locks (which hedge the interest rate risk associated with anticipated fixed-rate debt issuances and are designated as cash flow hedges), and floating-to-fixed interest rate swaps (which are designated as cash flow hedges). As of 31 March 2020, the outstanding interest rate swaps were denominated in U.S. Dollars. The notional amount of the interest rate swap agreements is equal to or less than the designated debt being hedged. When interest rate swaps are used to hedge variable-rate debt, the indices of the swaps and the debt to which they are designated are the same. It is our policy not to enter into any interest rate management contracts which lever a move in interest rates on a greater than one-to-one basis.

Cross Currency Interest Rate Swap Contracts

We enter into cross currency interest rate swap contracts when our risk management function deems necessary. These contracts may entail both the exchange of fixed- and floating-rate interest payments periodically over the life of the agreement and the exchange of one currency for another currency at inception and at a specified future date. The contracts are used to hedge either certain net investments in foreign operations or non-functional currency cash flows related to intercompany loans. The current cross currency interest rate swap portfolio consists of fixed-to-fixed swaps primarily between U.S. Dollars and Chinese Renminbi, U.S. Dollars and Indian Rupee, and U.S. Dollars and Chilean Pesos.

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The following table summarizes our outstanding interest rate management contracts and cross currency interest rate swaps:

	31 March 2020				30 September 2019			
	US\$ Notional	Average Pay %	Average Receive %	Years Average Maturity	US\$ Notional	Average Pay %	Average Receive %	Years Average Maturity
Interest rate swaps (fair value hedge)	\$200.0	LIBOR	2.76%	1.6	\$200.0	LIBOR	2.76%	2.1
Cross currency interest rate swaps (net investment hedge)	\$222.9	4.74%	3.32%	3.0	\$216.8	4.80%	3.31%	3.5
Cross currency interest rate swaps (cash flow hedge)	\$1,063.6	4.83%	3.07%	2.0	\$1,129.3	4.92%	3.04%	2.3
Cross currency interest rate swaps (not designated)	\$—	—%	—%	0.0	\$6.1	2.55%	3.72%	4.5

The table below provides the amounts recorded on the consolidated balance sheet related to cumulative basis adjustments for fair value hedges:

Balance Sheet Location	Carrying amounts of hedged item		Cumulative hedging adjustment, included in carrying amount	
	31 March 2020	30 September 2019	31 March 2020	30 September 2019
Long-term debt	\$407.4	\$404.7	\$7.8	\$5.2

The table below summarizes the fair value and balance sheet location of our outstanding derivatives:

	Balance Sheet Location	31 March 2020	30 September 2019	Balance Sheet Location	31 March 2020	30 September 2019
Derivatives Designated as Hedging Instruments:						
Forward exchange contracts	Other receivables and current assets	\$90.7	\$79.0	Payables and accrued liabilities	\$40.5	\$53.8
Interest rate management contracts	Other receivables and current assets	33.7	24.8	Payables and accrued liabilities	0.5	1.1
Forward exchange contracts	Other noncurrent assets	16.3	11.9	Other noncurrent liabilities	2.0	0.7
Interest rate management contracts	Other noncurrent assets	83.3	60.9	Other noncurrent liabilities	—	0.7
Total Derivatives Designated as Hedging Instruments		\$224.0	\$176.6		\$43.0	\$56.3
Derivatives Not Designated as Hedging Instruments:						
Forward exchange contracts	Other receivables and current assets	\$40.0	\$38.7	Payables and accrued liabilities	\$19.7	\$36.3
Forward exchange contracts	Other noncurrent assets	10.2	8.4	Other noncurrent liabilities	21.6	19.8
Interest rate management contracts	Other noncurrent assets	—	0.5	Other noncurrent liabilities	—	—
Total Derivatives Not Designated as Hedging Instruments		\$50.2	\$47.6		\$41.3	\$56.1
Total Derivatives		\$274.2	\$224.2		\$84.3	\$112.4

Refer to Note 11, *Fair Value Measurements*, which defines fair value, describes the method for measuring fair value, and provides additional disclosures regarding fair value measurements.

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The tables below summarize gains (losses) recognized in other comprehensive income during the period related to our net investment and cash flow hedging relationships:

	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
Net Investment Hedging Relationships				
Forward exchange contracts	\$40.5	\$8.2	31.4	23.7
Foreign currency debt	16.7	22.7	(13.2)	35.3
Cross currency interest rate swaps	12.4	(3.5)	8.9	(2.6)
Total Amount Recognized in OCI	69.6	27.4	27.1	56.4
Tax effects	(16.8)	(6.7)	(6.6)	(13.7)
Net Amount Recognized in OCI	\$52.8	\$20.7	20.5	42.7

	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
Derivatives in Cash Flow Hedging Relationships				
Forward exchange contracts	(\$10.1)	(\$22.2)	16.2	(13.3)
Forward exchange contracts, excluded components	(2.8)	(3.6)	(7.3)	(7.4)
Other ^(A)	(8.5)	(18.3)	(5.6)	(34.4)
Total Amount Recognized in OCI	(21.4)	(44.1)	3.3	(55.1)
Tax effects	(6.0)	8.7	(8.6)	9.4
Net Amount Recognized in OCI	(\$27.4)	(\$35.4)	(5.3)	(45.7)

^(A) Other primarily includes interest rate and cross currency interest rate swaps for which excluded components are recognized in "Payables and accrued liabilities" and "Other receivables and current assets" as a component of accrued interest payable and accrued interest receivable, respectively. These excluded components are recorded in "Other Non-operating income (expense), net" over the life of the cross currency interest rate swap. Other also includes the recognition of our share of gains and losses, net of tax, related to interest rate swaps held by our equity affiliates.

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The tables below summarize the location and amounts recognized in income related to our cash flow and fair value hedging relationships by contract type:

	Three Months Ended 31 March									
	Sales		Cost of Sales		Other Income (Expense), Net		Interest Expense		Other Non-Operating Income (Expense), Net	
	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019
Total Amounts Presented in the Consolidated Income Statement in which the Effects of Cash Flow and Fair Value Hedges are Recorded	\$2,216.3	\$2,187.7	\$1,460.1	\$1,474.7	\$8.1	\$10.4	\$19.3	\$35.4	\$7.1	\$13.7
(Gain) Loss Effects of Cash Flow Hedging:										
Forward Exchange Contracts:										
Amount reclassified from OCI into income ^(A)	(\$0.2)	\$—	(\$0.6)	(\$0.1)	\$—	\$24.8	\$—	\$4.2	\$5.9	\$—
Amount excluded from effectiveness testing recognized in earnings based on amortization approach ^(A)	—	—	—	—	—	—	—	—	4.1	—
Other:										
Amount reclassified from OCI into income ^(B)	—	—	—	—	—	18.5	1.0	1.0	(32.2)	—
Total (Gain) Loss Reclassified from OCI to Income	(0.2)	—	(0.6)	(0.1)	—	43.3	1.0	5.2	(22.2)	—
Tax effects	—	—	0.1	—	—	(10.1)	(0.3)	(1.4)	5.2	—
Net (Gain) Loss Reclassified from OCI to Income	(\$0.2)	\$—	(\$0.5)	(\$0.1)	\$—	\$33.2	\$0.7	\$3.8	(\$17.0)	\$—
(Gain) Loss Effects of Fair Value Hedging:										
Other:										
Hedged items	\$—	\$—	\$—	\$—	\$—	\$—	\$3.5	\$—	\$—	\$—
Derivatives designated as hedging instruments	—	—	—	—	—	—	(3.5)	—	—	—
Total (Gain) Loss Recognized in Income	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—

	Six Months Ended 31 March									
	Sales		Cost of Sales		Other Income (Expense), Net		Interest Expense		Other Non-Operating Income (Expense), Net	
	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019
Total Amounts Presented in the Consolidated Income Statement in which the Effects of Cash Flow and Fair Value Hedges are Recorded	\$4,471.0	\$4,411.7	\$2,946.7	\$3,018.7	\$20.4	\$19.0	\$38.0	\$72.7	\$16.2	\$32.2
(Gain) Loss Effects of Cash Flow Hedging:										
Forward Exchange Contracts:										
Amount reclassified from OCI into income ^(A)	(\$0.1)	\$0.4	(\$0.8)	\$0.1	\$—	\$12.9	\$—	\$8.4	(\$17.5)	\$—
Amount excluded from effectiveness testing recognized in earnings based on amortization approach ^(A)	—	—	—	—	—	—	—	—	8.6	—
Other:										
Amount reclassified from OCI into income ^(B)	—	—	—	—	—	20.7	2.0	2.0	(18.6)	—
Total (Gain) Loss Reclassified from OCI to Income	(0.1)	0.4	(0.8)	0.1	—	33.6	2.0	10.4	(27.5)	—
Tax effects	—	(0.1)	0.2	—	—	(7.8)	(0.6)	(2.8)	6.2	—
Net (Gain) Loss Reclassified from OCI to Income	(\$0.1)	\$0.3	(\$0.6)	\$0.1	\$—	\$25.8	\$1.4	\$7.6	(\$21.3)	\$—
(Gain) Loss Effects of Fair Value Hedging:										
Other:										
Hedged items	\$—	\$—	\$—	\$—	\$—	\$—	\$2.6	\$2.6	\$—	\$—
Derivatives designated as hedging instruments	—	—	—	—	—	—	(2.6)	(2.6)	—	—
Total (Gain) Loss Recognized in Income	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—	\$—

^(A) Net amount excluded from effectiveness testing recognized in interest expense for fiscal year 2019, see Note 2, *New Accounting Guidance*, for additional details.

^(B) Other primarily includes interest rate and cross currency interest rate swaps for which excluded components are recognized in "Payables and accrued liabilities" and "Other receivables and current assets" as a component of accrued interest payable and accrued interest receivable, respectively. These excluded components are recorded in "Other Non-operating income (expense), net" over the life of the cross currency interest rate swap.

The tables below summarize the location and amounts recognized in income related to our derivatives not designated as hedging instruments by contract type:

	Three Months Ended 31 March			
	Other Income (Expense), net		Other Non-Operating Income (Expense), net	
	2020	2019	2020	2019
The Effects of Derivatives Not Designated as a Hedging Instruments:				
Forward Exchange Contracts	(\$2.4)	\$2.2	\$1.2	\$—
Other	—	1.3	—	—
Total (Gain) Loss Recognized in Income	(\$2.4)	\$3.5	\$1.2	\$—

	Six Months Ended 31 March			
	Other Income (Expense)		Other Non-Operating Income (Expense)	
	2020	2019	2020	2019
The Effects of Derivatives Not Designated as a Hedging Instruments:				
Forward Exchange Contracts	(\$2.2)	\$2.3	\$0.6	\$—
Other	—	0.5	0.4	—
Total (Gain) Loss Recognized in Income	(\$2.2)	\$2.8	\$1.0	\$—

The amount of unrealized gains and losses related to cash flow hedges as of 31 March 2020 that are expected to be reclassified to earnings in the next twelve months is not material.

The cash flows related to all derivative contracts are reported in the operating activities section of the consolidated statements of cash flows.

Credit Risk-Related Contingent Features

Certain derivative instruments are executed under agreements that require us to maintain a minimum credit rating with both Standard & Poor's and Moody's. If our credit rating falls below this threshold, the counterparty to the derivative instruments has the right to request full collateralization on the derivatives' net liability position. The net liability position of derivatives with credit risk-related contingent features was \$32.5 and \$30.1 as of 31 March 2020 and 30 September 2019, respectively. Because our current credit rating is above the various pre-established thresholds, no collateral has been posted on these liability positions.

Counterparty Credit Risk Management

We execute financial derivative transactions with counterparties that are highly rated financial institutions, all of which are investment grade at this time. Some of our underlying derivative agreements give us the right to require the institution to post collateral if its credit rating falls below the pre-established thresholds with Standard & Poor's or Moody's. The collateral that the counterparties would be required to post was \$204.8 and \$157.1 as of 31 March 2020 and 30 September 2019, respectively. No financial institution is required to post collateral at this time as all have credit ratings at or above threshold.

11. FAIR VALUE MEASUREMENTS

Fair value is defined as an exit price, or 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 prioritizes the inputs to valuation techniques used to measure fair value into three broad levels as follows:

Level 1 — Quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2 — Inputs that are observable for the asset or liability, either directly or indirectly through market corroboration, for substantially the full term of the asset or liability.

Level 3 — Inputs that are unobservable for the asset or liability based on our own assumptions about the assumptions market participants would use in pricing the asset or liability.

The methods and assumptions used to measure the fair value of financial instruments are as follows:

Short-term Investments

Short-term investments primarily include time deposits with original maturities greater than three months and less than one year. We estimated the fair value of our short-term investments, which approximates carrying value as of the balance sheet date, using level 2 inputs within the fair value hierarchy. Level 2 measurements were based on current interest rates for similar investments with comparable credit risk and time to maturity.

Derivatives

The fair value of our interest rate management contracts and forward exchange contracts are quantified using the income approach and are based on estimates using standard pricing models. These models consider the value of future cash flows as of the balance sheet date, discounted to a present value using discount factors that match both the time to maturity and currency of the underlying instruments. The computation of the fair values of these instruments is generally performed by the Company. These standard pricing models utilize inputs that are derived from or corroborated by observable market data such as interest rate yield curves as well as currency spot and forward rates; therefore, the fair value of our derivatives is classified as a level 2 measurement. On an ongoing basis, we randomly test a subset of our valuations against valuations received from the transaction's counterparty to validate the accuracy of our standard pricing models. Counterparties to these derivative contracts are highly rated financial institutions.

Refer to Note 10, *Financial Instruments*, for a description of derivative instruments, including details related to the balance sheet line classifications.

Long-term Debt, Including Related Party

The fair value of our debt is based on estimates using standard pricing models that consider the value of future cash flows as of the balance sheet date, discounted to a present value using discount factors that match both the time to maturity and currency of the underlying instruments. These standard valuation models utilize observable market data such as interest rate yield curves and currency spot rates; therefore, the fair value of our debt is classified as a level 2 measurement. We generally perform the computation of the fair value of these instruments.

The carrying values and fair values of financial instruments were as follows:

	31 March 2020		30 September 2019	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Assets				
Derivatives				
Forward exchange contracts	\$157.2	\$157.2	\$138.0	\$138.0
Interest rate management contracts	117.0	117.0	86.2	86.2
Liabilities				
Derivatives				
Forward exchange contracts	\$83.8	\$83.8	\$110.6	\$110.6
Interest rate management contracts	0.5	0.5	1.8	1.8
Long-term debt, including current portion and related party	3,283.6	3,344.0	3,267.8	3,350.9

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The carrying amounts reported on the consolidated balance sheets for cash and cash items, short-term investments, trade receivables, payables and accrued liabilities, accrued income taxes, and short-term borrowings approximate fair value due to the short-term nature of these instruments. Accordingly, these items have been excluded from the above table.

The following table summarizes assets and liabilities on the consolidated balance sheets that are measured at fair value on a recurring basis:

	31 March 2020				30 September 2019			
	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
Assets at Fair Value								
Derivatives								
Forward exchange contracts	\$157.2	\$—	\$157.2	\$—	\$138.0	\$—	\$138.0	\$—
Interest rate management contracts	117.0	—	117.0	—	86.2	—	86.2	—
Total Assets at Fair Value	\$274.2	\$—	\$274.2	\$—	\$224.2	\$—	\$224.2	\$—
Liabilities at Fair Value								
Derivatives								
Forward exchange contracts	\$83.8	\$—	\$83.8	\$—	\$110.6	\$—	\$110.6	\$—
Interest rate management contracts	0.5	—	0.5	—	1.8	—	1.8	—
Total Liabilities at Fair Value	\$84.3	\$—	\$84.3	\$—	\$112.4	\$—	\$112.4	\$—

12. RETIREMENT BENEFITS

The components of net periodic benefit cost for our defined benefit pension plans for the three and six months ended 31 March 2020 and 2019 were as follows:

Three Months Ended 31 March	Pension Benefits			
	2020		2019	
	U.S.	International	U.S.	International
Service cost	\$5.8	\$5.8	\$5.3	\$4.9
Interest cost	22.8	6.2	28.4	9.0
Expected return on plan assets	(47.2)	(19.4)	(43.1)	(19.2)
Prior service cost amortization	0.3	—	0.3	0.1
Actuarial loss amortization	21.0	4.9	16.5	2.8
Settlements	1.5	—	5.0	—
Special termination benefits	—	—	—	—
Other	—	0.2	—	0.1
Net Periodic (Benefit) Cost	\$4.2	(\$2.3)	\$12.4	(\$2.3)

Six Months Ended 31 March	Pension Benefits			
	2020		2019	
	U.S.	International	U.S.	International
Service cost	\$11.6	\$11.7	\$10.7	\$9.8
Interest cost	45.6	12.4	56.8	18.0
Expected return on plan assets	(94.4)	(38.9)	(86.2)	(38.1)
Prior service cost amortization	0.6	—	0.6	0.1
Actuarial loss amortization	42.0	9.8	32.6	5.6
Settlements	1.5	—	5.8	0.2
Special termination benefits	—	—	0.7	—
Other	—	0.4	—	0.4
Net Periodic (Benefit) Cost	\$6.9	(\$4.6)	\$21.0	(\$4.0)

Our service costs are primarily included within "Cost of sales" and "Selling and administrative" on our consolidated income statements. The amount of service costs capitalized in the first six months of fiscal years 2020 and 2019 were not material. The non-service related costs, including pension settlement losses, are presented outside operating income within "Other non-operating income (expense), net."

For the six months ended 31 March 2020 and 2019, our cash contributions to funded pension plans and benefit payments under unfunded pension plans were \$14.9 and \$25.5, respectively. Total contributions for fiscal year 2020 are expected to be approximately \$30 to \$40. During fiscal year 2019, total contributions were \$40.2.

Certain of our pension plans provide for a lump sum benefit payment option at the time of retirement, or for corporate officers, six months after their retirement date. A participant's vested benefit is considered settled upon cash payment of the lump sum. We recognize pension settlement losses when cash payments exceed the sum of the service and interest cost components of net periodic benefit cost of the plan for the fiscal year. We recognized pension settlement losses of \$1.5 and \$5.0 in the second quarter of fiscal years 2020 and 2019, respectively, to accelerate recognition of a portion of actuarial losses deferred in accumulated other comprehensive loss, primarily associated with the U.S. supplementary pension plan.

U.K. Lloyds Pensions Equalization Ruling

On 26 October 2018, the United Kingdom High Court issued a ruling related to the equalization of pension plan participants' benefits for the gender effects of Guaranteed Minimum Pensions. As a result of this ruling, we estimated the impact of retroactively increasing benefits in our U.K. plan in accordance with the High Court ruling. We treated the additional benefits as a prior service cost, which resulted in an increase to our projected benefit obligation and accumulated other comprehensive loss of \$4.7 during the first quarter of fiscal year 2019. We are amortizing this cost over the average remaining life expectancy of the U.K. participants.

13. COMMITMENTS AND CONTINGENCIES

Litigation

We are involved in various legal proceedings, including commercial, competition, environmental, intellectual property, regulatory, product liability, and insurance matters. In September 2010, the Brazilian Administrative Council for Economic Defense ("CADE") issued a decision against our Brazilian subsidiary, Air Products Brasil Ltda., and several other Brazilian industrial gas companies for alleged anticompetitive activities. CADE imposed a civil fine of R\$179.2 million (approximately \$34 at 31 March 2020) on Air Products Brasil Ltda. This fine was based on a recommendation by a unit of the Brazilian Ministry of Justice, whose investigation began in 2003, alleging violation of competition laws with respect to the sale of industrial and medical gases. The fines are based on a percentage of our total revenue in Brazil in 2003.

We have denied the allegations made by the authorities and filed an appeal in October 2010 with the Brazilian courts. On 6 May 2014, our appeal was granted and the fine against Air Products Brasil Ltda. was dismissed. CADE has appealed that ruling and the matter remains pending. We, with advice of our outside legal counsel, have assessed the status of this matter and have concluded that, although an adverse final judgment after exhausting all appeals is possible, such a judgment is not probable. As a result, no provision has been made in the consolidated financial statements. We estimate the maximum possible loss to be the full amount of the fine of R\$179.2 million (approximately \$34 at 31 March 2020) plus interest accrued thereon until final disposition of the proceedings.

Other than this matter, we do not currently believe there are any legal proceedings, individually or in the aggregate, that are reasonably possible to have a material impact on our financial condition, results of operations, or cash flows.

Environmental

In the normal course of business, we are involved in legal proceedings under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA," the federal Superfund law), Resource Conservation and Recovery Act ("RCRA"), and similar state and foreign environmental laws relating to the designation of certain sites for investigation or remediation. Presently, there are 31 sites on which a final settlement has not been reached where we, along with others, have been designated a potentially responsible party by the Environmental Protection Agency or are otherwise engaged in investigation or remediation, including cleanup activity at certain of our current and former manufacturing sites. We continually monitor these sites for which we have environmental exposure.

Accruals for environmental loss contingencies are recorded when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. The consolidated balance sheets at 31 March 2020 and 30 September 2019 included an accrual of \$87.2 and \$68.9, respectively, primarily as part of other noncurrent liabilities. The environmental liabilities will be paid over a period of up to 30 years. We estimate the exposure for environmental loss contingencies to range from \$87 to a reasonably possible upper exposure of \$100 as of 31 March 2020.

Actual costs to be incurred at identified sites in future periods may vary from the estimates, given inherent uncertainties in evaluating environmental exposures. Using reasonably possible alternative assumptions of the exposure level could result in an increase to the environmental accrual. Due to the inherent uncertainties related to environmental exposures, a significant increase to the reasonably possible upper exposure level could occur if a new site is designated, the scope of remediation is increased, a different remediation alternative is identified, or a significant increase in our proportionate share occurs. We do not expect that any sum we may have to pay in connection with environmental matters in excess of the amounts recorded or disclosed above would have a material adverse impact on our financial position or results of operations in any one year.

Pace

At 31 March 2020, \$42.7 of the environmental accrual was related to the Pace facility.

In 2006, we sold our Amines business, which included operations at Pace, Florida, and recognized a liability for retained environmental obligations associated with remediation activities at Pace. We are required by the Florida Department of Environmental Protection ("FDEP") and the United States Environmental Protection Agency (USEPA) to continue our remediation efforts. We estimated that it would take a substantial period of time to complete the groundwater remediation, and the costs through completion were estimated to range from \$42 to \$52. As no amount within the range was a better estimate than another, we recognized a before-tax expense of \$42 in fiscal year 2006 in results from discontinued operations and recorded an environmental accrual of \$42 in continuing operations on the consolidated balance sheets.

During the second quarter of fiscal year 2020, we completed an updated review of the environmental remediation status at the Pace facility. The review was completed in conjunction with requirements to complete financial assurance per the Consent Order discussed below. Based on our review, we expect ongoing activities to continue for 30 years. Additionally, we will require near-term spending to install new wells and piping, as well as future capital to consider the longer than expected time horizon for remediation at the site. As a result of these changes, we increased our environmental accrual for this site by \$19 in continuing operations on the consolidated balance sheets and recognized a pre-tax expense of \$19 in results from discontinued operations in the second quarter of fiscal year 2020.

We have implemented many of the remedial corrective measures at the Pace facility required under 1995 Consent Orders issued by the FDEP and the USEPA. Contaminated soils have been bioremediated, and the treated soils have been secured in a lined on-site disposal cell. Several groundwater recovery systems have been installed to contain and remove contamination from groundwater. We completed an extensive assessment of the site to determine how well existing measures are working, what additional corrective measures may be needed, and whether newer remediation technologies that were not available in the 1990s might be suitable to more quickly and effectively remove groundwater contaminants. Based on assessment results, we completed a focused feasibility study that has identified alternative approaches that may more effectively remove contaminants. We continue to review alternative remedial approaches with the FDEP and have started additional field work to support the design of an improved groundwater recovery network with the objective of targeting areas of higher contaminant concentration and avoiding areas of high groundwater iron which has proven to be a significant operability issue for the project. In the first quarter of 2015, we entered into a new Consent Order with the FDEP requiring us to continue our remediation efforts at the Pace facility, along with the completion of a cost review every 5 years. In the second quarter of fiscal year 2020, we completed an updated cost review which resulted in a change in assumptions regarding future operating costs as discussed above. The costs we are incurring based on the fiscal year 2020 review are higher than our previous estimates.

Piedmont

At 31 March 2020, \$14.0 of the environmental accrual was related to the Piedmont site.

On 30 June 2008, we sold our Elkton, Maryland, and Piedmont, South Carolina, production facilities and the related North American atmospheric emulsions and global pressure sensitive adhesives businesses. In connection with the sale, we recognized a liability for retained environmental obligations associated with remediation activities at the Piedmont site. This site is under active remediation for contamination caused by an insolvent prior owner.

We are required by the South Carolina Department of Health and Environmental Control ("SCDHEC") to address both contaminated soil and groundwater. Numerous areas of soil contamination have been addressed, and contaminated groundwater is being recovered and treated. The SCDHEC issued its final approval to the site-wide feasibility study on 13 June 2017 and the Record of Decision for the site on 27 June 2018. Field work has started to support the remedial design, and in the fourth quarter of fiscal year 2018, we signed a Consent Agreement Amendment memorializing our obligations to complete the cleanup of the site. We estimate that source area remediation and groundwater recovery and treatment will continue through 2029. Thereafter, we expect this site to go into a state of monitored natural attenuation through 2047.

We recognized a before-tax expense of \$24 in 2008 as a component of income from discontinued operations and recorded an environmental liability of \$24 in continuing operations on the consolidated balance sheets. There have been no significant changes to the estimated exposure.

Pasadena

At 31 March 2020, \$11.6 of the environmental accrual was related to the Pasadena site.

During the fourth quarter of 2012, management committed to permanently shutting down our polyurethane intermediates ("PUI") production facility in Pasadena, Texas. In shutting down and dismantling the facility, we have undertaken certain obligations related to soil and groundwater contaminants. We have been pumping and treating groundwater to control off-site contaminant migration in compliance with regulatory requirements and under the approval of the Texas Commission on Environmental Quality ("TCEQ"). We estimate that the pump and treat system will continue to operate until 2042.

We plan to perform additional work to address other environmental obligations at the site. This additional work includes remediating, as required, impacted soils, investigating groundwater west of the former PUI facility, performing post closure care for two closed RCRA surface impoundment units, and establishing engineering controls. In 2012, we estimated the total exposure at this site to be \$13. There have been no significant changes to the estimated exposure.

14. SHARE-BASED COMPENSATION

We have various share-based compensation programs, which include deferred stock units, stock options, and restricted stock. During the six months ended 31 March 2020, we granted market-based and time-based deferred stock units. Under all programs, the terms of the awards are fixed at the grant date. We issue shares from treasury stock upon the payout of deferred stock units, the exercise of stock options, and the issuance of restricted stock awards. As of 31 March 2020, there were 4,321,658 shares available for future grant under our Long-Term Incentive Plan ("LTIP"), which is shareholder approved.

Share-based compensation cost recognized on the consolidated income statements is summarized below:

	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
Before-tax share-based compensation cost	\$13.5	\$11.9	\$28.9	\$21.2
Income tax benefit	(3.1)	(2.8)	(6.8)	(5.0)
After-tax share-based compensation cost	\$10.4	\$9.1	\$22.1	\$16.2

Before-tax share-based compensation cost is primarily included in "Selling and administrative" on our consolidated income statements. The amount of share-based compensation cost capitalized in the first six months of fiscal years 2020 and 2019 was not material.

Deferred Stock Units

During the six months ended 31 March 2020, we granted 80,215 market-based deferred stock units. The market-based deferred stock units are earned at the end of the performance period beginning 1 October 2019 and ending 30 September 2022, conditioned on the level of the Company's total shareholder return in relation to a defined peer group over the three-year performance period.

The market-based deferred stock units had an estimated grant-date fair value of \$275.19 per unit, which was estimated using a Monte Carlo simulation model. The model utilizes multiple input variables that determine the probability of satisfying the market condition stipulated in the grant and calculates the fair value of the awards. We generally expense the grant-date fair value of these awards on a straight-line basis over the vesting period. The calculation of the fair value of market-based deferred stock units used the following assumptions:

Expected volatility	17.8%
Risk-free interest rate	1.6%
Expected dividend yield	2.4%

In addition, during the six months ended 31 March 2020, we granted 118,194 time-based deferred stock units at a weighted average grant-date fair value of \$229.15.

15. ACCUMULATED OTHER COMPREHENSIVE LOSS

The tables below summarize changes in accumulated other comprehensive loss ("AOCL"), net of tax, attributable to Air Products for the three and six months ended 31 March 2020:

	Derivatives qualifying as hedges	Foreign currency translation adjustments	Pension and postretirement benefits	Total
Balance at 31 December 2019	(\$48.5)	(\$1,102.5)	(\$937.6)	(\$2,088.6)
Other comprehensive loss before reclassifications	(27.4)	(398.2)	—	(425.6)
Amounts reclassified from AOCL	(17.0)	—	21.2	4.2
Net current period other comprehensive income (loss)	(44.4)	(398.2)	21.2	(421.4)
Amount attributable to noncontrolling interests	(25.6)	(6.2)	—	(31.8)
Balance at 31 March 2020	(\$67.3)	(\$1,494.5)	(\$916.4)	(\$2,478.2)

	Derivatives qualifying as hedges	Foreign currency translation adjustments	Pension and postretirement benefits	Total
Balance at 30 September 2019	(\$61.4)	(\$1,356.9)	(\$957.3)	(\$2,375.6)
Other comprehensive loss before reclassifications	(5.3)	(134.2)	—	(139.5)
Amounts reclassified from AOCL	(20.6)	—	40.9	20.3
Net current period other comprehensive income (loss)	(25.9)	(134.2)	40.9	(119.2)
Amount attributable to noncontrolling interests	(20.0)	3.4	—	(16.6)
Balance at 31 March 2020	(\$67.3)	(\$1,494.5)	(\$916.4)	(\$2,478.2)

The table below summarizes the reclassifications out of AOCL and the affected line item on the consolidated income statements:

	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
(Gain) Loss on Cash Flow Hedges, net of tax				
Sales/Cost of sales	(\$0.7)	(\$0.1)	(\$0.7)	\$0.4
Other income/expense, net	—	33.2	—	25.8
Interest expense	0.7	3.8	1.4	7.6
Other non-operating income (expense), net ^(A)	(17.0)	—	(21.3)	—
Total (Gain) Loss on Cash Flow Hedges, net of tax	(\$17.0)	\$36.9	(\$20.6)	\$33.8
Pension and Postretirement Benefits, net of tax ^(B)	\$21.2	\$18.7	\$40.9	\$33.9

^(A) The fiscal year 2020 impact includes amortization of the excluded component and the effective portion of the related hedges.

^(B) The components of net periodic benefit cost reclassified out of AOCL include items such as prior service cost amortization, actuarial loss amortization, and settlements and are included in "Other non-operating income (expense), net" on the consolidated income statements. Refer to Note 12, *Retirement Benefits*, for additional information.

16. EARNINGS PER SHARE

The following table sets forth the computation of basic and diluted earnings per share ("EPS"):

	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
Numerator				
Net income from continuing operations	\$492.1	\$421.3	\$967.7	\$768.8
Net loss from discontinued operations	(14.3)	—	(14.3)	—
Net Income Attributable to Air Products	\$477.8	\$421.3	\$953.4	\$768.8
Denominator (in millions)				
Weighted average common shares — Basic	221.2	220.2	221.0	220.0
Effect of dilutive securities				
Employee stock option and other award plans	1.1	1.2	1.2	1.2
Weighted average common shares — Diluted	222.3	221.4	222.2	221.2
Basic EPS Attributable to Air Products^(A)				
Basic EPS from continuing operations	\$2.22	\$1.91	\$4.38	\$3.49
Basic EPS from discontinued operations	(0.06)	—	(0.06)	—
Basic EPS Attributable to Air Products	\$2.16	\$1.91	\$4.31	\$3.49
Diluted EPS Attributable to Air Products^(A)				
Diluted EPS from continuing operations	\$2.21	\$1.90	\$4.36	\$3.48
Diluted EPS from discontinued operations	(0.06)	—	(0.06)	—
Diluted EPS Attributable to Air Products	\$2.15	\$1.90	\$4.29	\$3.48

^(A) Earnings per share ("EPS") is calculated independently for each component and may not sum to total EPS due to rounding.

For the three and six months ended 31 March 2020 and 2019, there were no antidilutive outstanding share-based awards.

17. INCOME TAXES

India Finance Act 2020

On 27 March 2020, the Indian government passed Finance Act 2020 (the "India Finance Act"), which amended rules regarding the taxation of dividends declared and distributed by Indian companies. Under the India Finance Act, future dividends declared or distributed by an Indian company are no longer subject to dividend distribution tax. Instead, the non-resident recipient will be subject to a withholding tax.

As a result of the India Finance Act, we recorded a net benefit of \$13.5 in March 2020 related to our equity affiliate investment in INOX Air Products Private Limited ("INOX"). This included a benefit of \$33.8 for our share of accumulated dividend distribution taxes released with respect to INOX. This benefit is reflected within "Equity affiliates' income" on our consolidated income statements and has been excluded from the results of our Industrial Gases – Asia segment. In addition, our income tax provision reflects an expense of \$20.3 for estimated withholding taxes that we may incur on future dividends.

U.S. Tax Cuts and Jobs Act

Our income tax provision for the six months ended 31 March 2019 reflected a discrete net income tax expense of \$40.6 related to impacts from the U.S. Tax Cuts and Jobs Act (the "Tax Act"). The net expense included the reversal of a non-recurring \$56.2 benefit recorded in fiscal year 2018 related to the U.S. taxation of deemed foreign dividends. This was partially offset by a benefit of \$15.6 to finalize our estimates of the impacts of the Tax Act and reduce the total expected costs of the deemed repatriation tax.

Effective Tax Rate

The effective tax rate was 22.7% and 21.3% for the three and six months ended 31 March 2020, respectively. The effective tax rate was 19.9% and 23.3% for the three and six months ended 31 March 2019, respectively.

Cash Paid for Taxes (Net of Cash Refunds)

Income tax payments, net of refunds, were \$253.5 and \$165.6 for the six months ended 31 March 2020 and 2019, respectively.

18. SUPPLEMENTAL INFORMATION**Company Headquarters Relocation Income (Expense)**

During the second quarter of fiscal year 2020, we sold property at our current corporate headquarters located in Trexlertown, Pennsylvania, for net proceeds of \$44.1. The sale was completed in anticipation of relocating our U.S. headquarters and resulted in a gain of \$33.8. This gain is reflected on our consolidated income statements as "Company headquarters relocation income (expense)" for the three and six months ended 31 March 2020 and has been excluded from the results of the Corporate and other segment.

Facility Closure

In December 2018, one of our customers was subject to a government enforced shutdown due to environmental reasons. As a result, we recognized a charge of \$29.0 during the first quarter of fiscal year 2019 primarily related to the write-off of onsite assets. This charge is reflected as "Facility closure" on our consolidated income statements for the six months ended 31 March 2019 and has not been recorded in segment results.

Related Party Transactions

We have related party sales to some of our equity affiliates and joint venture partners as well as other income primarily from fees charged for use of Air Products' patents and technology. Sales to and other income from related parties totaled approximately \$90 and \$180 for the three and six months ended 31 March 2020, respectively, and \$80 and \$165 for the three and six months ended 31 March 2019, respectively. Sales agreements with related parties include terms that are consistent with those that we believe would have been negotiated at an arm's length with an independent party. Our consolidated balance sheets include related party trade receivables of approximately \$205 and \$130 as of 31 March 2020 and 30 September 2019, respectively.

Air Products Lu An (Changzhi) Co., Ltd., our 60% owned JV with Lu'An Clean Energy Company ("Lu'An"), acquired gasification and syngas clean-up assets from Lu'An in 2018. The table below summarizes the related party liabilities resulting from this acquisition as reflected on our consolidated balance sheets:

	31 March 2020	30 September 2019
Payables and accrued liabilities	8.9	8.9
Current portion of long-term debt	38.1	37.8
Long-term debt – related party	323.1	320.1

19. BUSINESS SEGMENT INFORMATION

Our reporting segments reflect the manner in which our chief operating decision maker reviews results and allocates resources. Except in the Industrial Gases – EMEA and Corporate and other segments, each reporting segment meets the definition of an operating segment and does not include the aggregation of multiple operating segments. Our Industrial Gases – EMEA and Corporate and other segments each include the aggregation of two operating segments that meet the aggregation criteria under GAAP.

Our reporting segments are:

- Industrial Gases – Americas;
- Industrial Gases – EMEA (Europe, Middle East, and Africa);
- Industrial Gases – Asia;
- Industrial Gases – Global; and
- Corporate and other

	Industrial Gases – Americas	Industrial Gases – EMEA	Industrial Gases – Asia	Industrial Gases – Global	Corporate and other	Total
Three Months Ended 31 March 2020						
Sales	\$932.4	\$492.7	\$658.1	\$79.3	\$53.8	\$2,216.3 ^(A)
Operating income (loss)	268.0	124.6	209.1	(19.8)	(38.5)	543.4 ^(B)
Depreciation and amortization	135.5	47.6	104.1	2.4	5.1	294.7
Equity affiliates' income	21.6	13.5	13.8	5.5	—	54.4 ^(B)
Three Months Ended 31 March 2019						
Sales	\$991.7	\$494.4	\$625.4	\$53.8	\$22.4	\$2,187.7 ^(A)
Operating income (loss)	255.6	122.5	199.7	(12.2)	(49.1)	516.5 ^(B)
Depreciation and amortization	124.9	46.3	84.9	2.0	4.0	262.1
Equity affiliates' income	17.8	13.3	13.8	1.3	—	46.2 ^(B)
	Industrial Gases – Americas	Industrial Gases – EMEA	Industrial Gases – Asia	Industrial Gases – Global	Corporate and other	Total
Six Months Ended 31 March 2020						
Sales	\$1,868.6	\$991.4	\$1,350.9	\$171.9	\$88.2	\$4,471.0 ^(A)
Operating income (loss)	525.2	245.1	437.6	(16.2)	(87.3)	1,104.4 ^(B)
Depreciation and amortization	267.3	96.0	205.7	4.8	10.1	583.9
Equity affiliates' income	42.2	32.8	30.7	6.9	—	112.6 ^(B)
Six Months Ended 31 March 2019						
Sales	\$1,980.9	\$1,018.6	\$1,252.2	\$122.0	\$38.0	\$4,411.7 ^(A)
Operating income (loss)	474.8	228.1	401.5	(8.3)	(95.6)	1,000.5 ^(B)
Depreciation and amortization	250.5	92.6	164.8	4.1	8.1	520.1
Equity affiliates' income	40.4	27.0	30.0	1.7	—	99.1 ^(B)
Total Assets						
31 March 2020	\$5,933.7	\$3,378.8	\$6,489.7	\$438.1	\$3,260.9	\$19,501.2
30 September 2019	5,832.2	3,250.8	6,240.6	325.7	3,293.5	18,942.8

^(A) The sales information noted above relates to external customers only. All intersegment sales are eliminated in consolidation. Intersegment sales are generally transacted at market pricing. We generally do not have intersegment sales from our regional industrial gases businesses. Equipment manufactured for our regional industrial gases segments are generally transferred at cost and are not reflect as an intersegment sale.

^(B) Refer to the *Reconciliations to Consolidated Results* section below.

Reconciliations to Consolidated Results

The table below reconciles total operating income in the table above to consolidated operating income as reflected on our consolidated income statements:

	Three Months Ended 31 March		Six Months Ended 31 March	
Operating Income	2020	2019	2020	2019
Total	\$543.4	\$516.5	\$1,104.4	\$1,000.5
Facility closure	—	—	—	(29.0)
Company headquarters relocation income (expense)	33.8	—	33.8	—
Consolidated Operating Income	\$577.2	\$516.5	\$1,138.2	\$971.5

The table below reconciles total equity affiliates' income in the table above to consolidated equity affiliates' income as reflected on our consolidated income statements:

Equity Affiliates' Income	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
Total	\$54.4	\$46.2	\$112.6	\$99.1
India Finance Act 2020	33.8	—	33.8	—
Consolidated Equity Affiliates' Income	\$88.2	\$46.2	\$146.4	\$99.1

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

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The discussion that follows includes a comparison of our results of operations and liquidity and capital resources for the second quarter and first six months of fiscal years 2020 and 2019. The disclosures provided in this quarterly report are complementary to those made in our 2019 Form 10-K.

The following discussion should be read in conjunction with the consolidated financial statements and the accompanying notes contained in this quarterly report. Unless otherwise stated, financial information is presented in millions of dollars, except for per share data. Except for net income, which includes discontinued operations, financial information is presented on a continuing operations basis.

The financial measures included in the discussion that follows are presented in accordance with U.S. generally accepted accounting principles ("GAAP"), except as noted. We present certain financial measures on an "adjusted" or "non-GAAP" basis because we believe such measures, when viewed together with financial results computed in accordance with GAAP, provide a more complete understanding of the factors and trends affecting our historical financial performance. For each non-GAAP financial measure, including adjusted diluted earnings per share ("EPS"), adjusted EBITDA, adjusted EBITDA margin, and adjusted effective tax rate, we present a reconciliation to the most directly comparable financial measure calculated in accordance with GAAP. These reconciliations and explanations regarding the use of these measures are presented on pages 52-58.

SECOND QUARTER 2020 VS. SECOND QUARTER 2019

SECOND QUARTER 2020 IN SUMMARY

The results below are compared to the second quarter of fiscal year 2019.

- Sales of \$2,216.3 increased 1%, or \$28.6, as higher volumes and positive pricing were mostly offset by lower energy and natural gas cost pass-through to customers and unfavorable currency. We estimate that sales were approximately 1% lower than prior year due to impacts from the COVID-19 pandemic, primarily driven by lower China merchant volumes in the Industrial Gases – Asia segment.
- Operating income of \$577.2 increased 12%, or \$60.7, and operating margin of 26.0% increased 240 basis points ("bp").
- Net income of \$490.4 increased 13%, or \$56.9, and net income margin of 22.1% increased 230 bp.
- Adjusted EBITDA of \$892.5 increased 8%, or \$67.7, and adjusted EBITDA margin of 40.3% increased 260 bp.
- Diluted EPS of \$2.21 increased 16%, or \$0.31 per share. Adjusted diluted EPS of \$2.04 increased 6%, or \$0.12 per share. A summary table of changes in diluted EPS is presented below.
- We increased our quarterly dividend by over 15% from \$1.16 to \$1.34 per share, representing the largest dividend increase in the Company's history. This is the 38th consecutive year that we have increased our quarterly dividend payment.

Changes in Diluted EPS

The per share impacts presented in the table below were calculated independently and may not sum to the total change in diluted EPS due to rounding.

	Three Months Ended 31 March		Increase (Decrease)
	2020	2019	
Diluted EPS attributable to Air Products	\$2.15	\$1.90	\$0.25
Diluted EPS from discontinued operations	(0.06)	—	(0.06)
Diluted EPS From Continuing Operations	\$2.21	\$1.90	\$0.31
Operating Impacts			
Underlying business			
Volume ^(A)			\$0.13
Price, net of variable costs			0.19
Other costs			(0.17)
Currency			(0.05)
Company headquarters relocation income (expense)			0.12
Total Operating Impacts			\$0.22
Other Impacts			
Equity affiliates' income			\$0.03
Interest expense			0.06
Other non-operating income (expense), net			(0.02)
Change in effective tax rate, excluding discrete item below			(0.02)
India Finance Act 2020			0.06
Weighted average diluted shares			(0.01)
Total Other Impacts			\$0.10
Total Change in Diluted EPS From Continuing Operations			\$0.31

^(A) Includes an estimated negative impact of \$0.06-\$0.08 from COVID-19, primarily in our Asia merchant business.

	Three Months Ended 31 March		Increase (Decrease)
	2020	2019	
Diluted EPS From Continuing Operations	\$2.21	\$1.90	\$0.31
Company headquarters relocation (income) expense	(0.12)	—	(0.12)
India Finance Act 2020	(0.06)	—	(0.06)
Pension settlement loss	—	0.02	(0.02)
Adjusted Diluted EPS From Continuing Operations	\$2.04	\$1.92	\$0.12

SECOND QUARTER 2020 RESULTS OF OPERATIONS

Discussion of Consolidated Results

	Three Months Ended 31 March			
	2020	2019	\$ Change	Change
GAAP Measures				
Sales	\$2,216.3	\$2,187.7	\$28.6	1%
Operating income	577.2	516.5	60.7	12%
Operating margin	26.0%	23.6%		240 bp
Equity affiliates' income	88.2	46.2	42.0	91%
Net income	490.4	433.5	56.9	13%
Net income margin	22.1%	19.8%		230 bp
Non-GAAP Measures				
Adjusted EBITDA	\$892.5	\$824.8	\$67.7	8%
Adjusted EBITDA margin	40.3%	37.7%		260 bp

As further discussed below, the novel coronavirus ("COVID-19") global pandemic did not have a significant impact on our consolidated results of operations in the second quarter of fiscal year 2020. Our operations are among businesses that generally have been considered essential by local governments and public health authorities. We continue to safely maintain plant operations and focus on business continuity. Our second quarter sales and profit grew versus the prior year despite the disruption caused by COVID-19. Overall, we estimate that COVID-19 negatively impacted our volumes by approximately 1%, primarily in the Asia merchant business, for which volumes recovered to normal levels in late March 2020. Our merchant businesses in the Americas and EMEA region were slightly impacted as volume impacts did not begin until the end of March 2020. We expect declines in merchant volume in the Industrial Gases – Americas and Industrial Gases – EMEA segments to continue and be more significant into the third quarter and potentially longer depending on the duration of the COVID-19 pandemic and measures implemented by governments, public health authorities and businesses to mitigate the spread of COVID-19.

We will continue to evaluate the nature and extent of future impacts of COVID-19 on our business, particularly in our Industrial Gases – Americas and Industrial Gases – EMEA segments. Given the dynamic nature of these circumstances, the full impact of the COVID-19 pandemic on our ongoing business, results of operations, and overall financial performance cannot be reasonably estimated at this time.

Further, the timing of financial closing on our Jazan gas and power project has experienced some delay, which will also delay earnings from the project.

Sales

Sales % Change from Prior Year

Volume	6 %
Price	2 %
Energy and natural gas cost pass-through	(5)%
Currency	(2)%
Total Consolidated Sales Change	1 %

Sales of \$2,216.3 increased 1%, or \$28.6, as higher volumes of 6% and favorable pricing of 2% were mostly offset by lower energy and natural gas cost pass-through to customers of 5% and an unfavorable impact from currency of 2%. Both volume and price were higher across the regional segments. Positive volumes from our base business, new plants, prior year acquisitions, and a short-term contract in Asia were partially offset by the estimated 1% negative impact resulting from COVID-19 on our merchant business. Our existing onsite business remained stable in the second quarter. The pricing improvement was attributable to our merchant business. Unfavorable currency impacts were driven by the Chinese Renminbi, Euro, and South Korean Won.

Cost of Sales and Gross Margin

Cost of sales of \$1,460.1 decreased 1%, or \$14.6. The decrease from the prior year was driven by lower energy and natural gas cost pass-through to customers of \$108 and positive currency impacts of \$31, partially offset by higher costs attributable to sales volumes of \$97 and higher other costs of \$27. Gross margin of 34.1% increased 150 bp, primarily due to positive pricing and lower energy and natural gas cost pass-through to customers, partially offset by unfavorable net operating costs.

Selling and Administrative

Selling and administrative expense of \$201.7 increased 6%, or \$11.7, from investing in business development resources to support our growth strategy. Selling and administrative expense as a percentage of sales increased from 8.7% to 9.1%.

Research and Development

Research and development expense of \$19.2 increased 14%, or \$2.3. Research and development expense as a percentage of sales increased from 0.8% to 0.9%.

Company Headquarters Relocation Income (Expense)

During the second quarter of fiscal year 2020, we sold property at our current corporate headquarters located in Trexlertown, Pennsylvania, for net proceeds of \$44.1. The sale was completed in anticipation of relocating our U.S. headquarters and resulted in a gain of \$33.8 (\$25.6 after-tax, or \$0.12 per share). This gain is reflected on our consolidated income statements as "Company headquarters relocation income (expense)" for the three months ended 31 March 2020 and has been excluded from the results of the Corporate and other segment.

Other Income (Expense), Net

Other income (expense), net of \$8.1 decreased 22%, or \$2.3, primarily due to foreign exchange impacts.

Operating Income and Operating Margin

Operating income of \$577.2 increased 12%, or \$60.7, due to positive pricing, net of power and fuel costs, of \$54, favorable volumes of \$35, and income associated with the company headquarters relocation of \$34, partially offset by higher net operating costs of \$48 and unfavorable currency impacts of \$14. Net operating costs were higher primarily due to higher planned maintenance costs, particularly in North America, and our continued investment in resources to support our growth strategy. We expect previously planned maintenance activities to be delayed in the second half of the year due to the COVID-19 pandemic.

Operating margin of 26.0% increased 240 bp, primarily due to positive pricing, the impact of income associated with the company headquarters relocation, and lower energy and natural gas cost pass-through to customers, partially offset by unfavorable net operating costs.

Equity Affiliates' Income

Equity affiliates' income of \$88.2 increased 91%, or \$42.0, primarily due to a current year benefit of \$33.8 for the release of our share of accumulated dividend distribution taxes related to an Indian affiliate as a result of the enactment of a tax law in India. Refer to Note 17, *Income Taxes*, to the consolidated financial statements for additional information.

Interest Expense

	Three Months Ended 31 March	
	2020	2019
Interest incurred	\$23.2	\$38.5
Less: Capitalized interest	3.9	3.1
Interest expense	\$19.3	\$35.4

Interest incurred decreased 40%, or \$15.3. The prior year included \$9.1 of interest expense related to foreign currency forward points and currency swap basis differences of our cash flow hedges of intercompany loans. As discussed in Note 2, *New Accounting Guidance*, to the consolidated financial statements, we adopted new accounting guidance on hedging activities that changed the presentation of these items from "Interest expense, net" to "Other non-operating income (expense), net" in fiscal year 2020. In addition to this presentation change, interest expense decreased due to lower interest expense associated with financing the Lu'An joint venture and a lower average debt balance. Capitalized interest increased 26%, or \$0.8, due to an increase in the carrying value of projects under construction.

Other Non-Operating Income (Expense), Net

Other non-operating income (expense), net, of \$7.1 decreased 48%, or \$6.6, primarily due to the impact of the adoption of the guidance on hedging activities discussed above and lower interest income on cash and cash items, partially offset by higher non-service pension income and a prior year pension settlement loss of \$5.0 (\$3.8 after-tax, or \$0.02 per share) associated with the U.S. Supplementary Pension Plan.

Discontinued Operations

During the second quarter of fiscal year 2020, we recorded a pre-tax loss from discontinued operations of \$19.0 (\$14.3 after-tax, or \$0.06 per share) to increase our liability for retained environmental obligations associated with the sale of our former Amines business in September 2006. Refer to the Pace discussion within Note 13, *Commitments and Contingencies*, to the consolidated financial statements for additional information.

Net Income and Net Income Margin

Net income of \$490.4 increased 13%, or \$56.9, primarily due to positive pricing, higher volumes, current year income associated with the company headquarters relocation, and impacts from the enactment of a tax law in India, partially offset by unfavorable costs, including the after-tax loss from discontinued operations. Net income margin of 22.1% increased 230 bp, primarily due to the factors noted above as well as lower energy and natural gas cost pass-through to customers.

Adjusted EBITDA and Adjusted EBITDA Margin

Adjusted EBITDA of \$892.5 increased 8%, or \$67.7, primarily due to higher volumes and positive pricing, partially offset by unfavorable operating costs. Adjusted EBITDA margin of 40.3% increased 260 bp, primarily due to lower energy and natural gas cost pass-through to customers and positive pricing, partially offset by unfavorable operating costs.

Effective Tax Rate

The effective tax rate equals the income tax provision divided by income from continuing operations before taxes. The effective tax rate was 22.7% and 19.9% in the second quarter of fiscal years 2020 and 2019, respectively.

The current year rate was impacted by the enactment of a tax law in India ("India Finance Act 2020"), which resulted in additional net income of \$13.5 (\$0.06 per share). This included an increase to equity affiliates' income of \$33.8, partially offset by an increase to our income tax provision of \$20.3 for changes in the future tax costs of repatriated earnings. The current year rate was also impacted by lower excess tax benefits on share-based compensation compared to the second quarter of 2019.

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The adjusted effective tax rate increased from 19.9% in the second quarter of fiscal year 2019 to 20.5% in the second quarter of fiscal year 2020. This increase was primarily driven by lower excess tax benefits on share-based compensation compared to the second quarter of 2019.

Refer to Note 17, *Income Taxes*, to the consolidated financial statements for additional information.

Segment Analysis

Industrial Gases – Americas

	Three Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$932.4	\$991.7	(\$59.3)	(6)%
Operating income	268.0	255.6	12.4	5 %
Operating margin	28.7%	25.8%		290 bp
Equity affiliates' income	21.6	17.8	3.8	21 %
Adjusted EBITDA	425.1	398.3	26.8	7 %
Adjusted EBITDA margin	45.6%	40.2%		540 bp

Sales % Change from Prior Year

Volume	2 %
Price	3 %
Energy and natural gas cost pass-through	(9)%
Currency	(2)%

Total Industrial Gases – Americas Sales Change (6)%

Sales of \$932.4 decreased 6%, or \$59.3, as lower energy and natural gas cost pass-through of 9% and a negative impact from currency of 2% were only partially offset by positive pricing of 3% and higher volumes of 2%. The pricing improvement was driven by our merchant business. Positive volumes were primarily driven by hydrogen demand in the Gulf Coast and Canada.

The COVID-19 pandemic began impacting our merchant business at the end of March 2020. We expect these volume impacts to continue and be more significant in the third quarter. Additionally, we expect North America maintenance activities that were previously planned for the second half of the year to be delayed due to the COVID-19 pandemic.

Operating income of \$268.0 increased 5%, or \$12.4, primarily due to higher pricing, net of power and fuel costs, of \$23 and favorable volumes of \$11, partially offset by higher net operating costs of \$21. The higher net operating costs were primarily driven by higher maintenance costs. Operating margin of 28.7% increased 290 bp, primarily due to lower energy and natural gas cost pass-through to customers and positive pricing, partially offset by unfavorable cost performance. The lower energy and natural gas cost pass-through to customers contributed approximately 250 bp.

Equity affiliates' income of \$21.6 increased 21%, or \$3.8, primarily driven by improved results from our affiliates in Mexico.

Industrial Gases – EMEA (Europe, Middle East, and Africa)

	Three Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$492.7	\$494.4	(\$1.7)	—%
Operating income	124.6	122.5	2.1	2%
Operating margin	25.3%	24.8%		50 bp
Equity affiliates' income	13.5	13.3	0.2	2%
Adjusted EBITDA	185.7	182.1	3.6	2%
Adjusted EBITDA margin	37.7%	36.8%		90 bp

Sales % Change from Prior Year

Volume	4 %
Price	3 %
Energy and natural gas cost pass-through	(4)%
Currency	(3)%
Total Industrial Gases – EMEA Sales Change	— %

Sales of \$492.7 were flat as favorable volumes of 4% and positive pricing of 3% were offset by lower energy and natural gas cost pass-through to customers of 4% and unfavorable currency impacts of 3%. The volume increase was primarily driven by new projects and the carbon dioxide business we acquired in the prior year, with solid refinery hydrogen demand. The pricing improvement was attributable to our merchant business. The negative currency impact was mainly driven by the Euro.

The COVID-19 pandemic began impacting our merchant business at the end of March 2020. We expect these volume impacts to continue and be more significant in the third quarter, particularly in our merchant packaged gases business, which is characterized by smaller, more economically sensitive customers.

Operating income of \$124.6 increased 2%, or \$2.1, primarily due to higher pricing, net of power and fuel costs, of \$20, partially offset by higher costs of \$14 and unfavorable currency impacts of \$3. Operating margin of 25.3% increased 50 bp, primarily due to favorable pricing and lower energy and natural gas cost pass-through to customers, partially offset by higher costs and unfavorable volume mix.

Equity affiliates' income of \$13.5 increased 2%, or \$0.2.

Industrial Gases – Asia

	Three Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$658.1	\$625.4	\$32.7	5%
Operating income	209.1	199.7	9.4	5%
Operating margin	31.8%	31.9%		(10) bp
Equity affiliates' income	13.8	13.8	—	—%
Adjusted EBITDA	327.0	298.4	28.6	10%
Adjusted EBITDA margin	49.7%	47.7%		200 bp

Sales % Change from Prior Year

Volume	6 %
Price	2 %
Energy and natural gas cost pass-through	— %
Currency	(3)%
Total Industrial Gases – Asia Sales Change	5 %

Sales of \$658.1 increased 5%, or \$32.7, as higher volumes of 6% and positive pricing of 2% were partially offset by unfavorable currency impacts of 3%. Volumes increased primarily due to new plants and a short-term supply contract. We estimate that the disruption due to the COVID-19 pandemic negatively impacted overall volumes by approximately 4%. While our onsite volumes remained stable, we estimate that our merchant volumes declined approximately 25% due to COVID-19 for about six weeks after the Lunar New Year holiday before recovering to normal levels in late March 2020. Pricing improved across Asia, driven by our merchant business. The unfavorable currency impact was primarily attributable to the Chinese Renminbi and the South Korean Won. Energy and natural gas cost pass-through to customers was flat versus the prior year.

Operating income of \$209.1 increased 5%, or \$9.4, primarily due to positive pricing, net of power and fuel costs, of \$11 and favorable volumes of \$6, partially offset by unfavorable currency impacts of \$6. Operating margin of 31.8% decreased 10 bp as unfavorable volume mix was mostly offset by positive pricing.

Equity affiliates' income of \$13.8 was flat versus the prior year.

Industrial Gases – Global

The Industrial Gases – Global segment includes sales of cryogenic and gas processing equipment for air separation and centralized global costs associated with management of all the Industrial Gases segments.

	Three Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$79.3	\$53.8	\$25.5	47 %
Operating loss	(19.8)	(12.2)	(7.6)	(62)%
Adjusted EBITDA	(11.9)	(8.9)	(3.0)	(34)%

Sales of \$79.3 increased 47%, or \$25.5. The increase in sales was primarily driven by higher sale of equipment activity.

Operating loss of \$19.8 increased 62%, or \$7.6, as higher project development costs were only partially offset by the higher current quarter sale of equipment activity.

Corporate and other

The Corporate and other segment includes our liquefied natural gas ("LNG"), turbo machinery equipment, and distribution sale of equipment businesses and corporate support functions that benefit all segments. The results of the Corporate and other segment also include income and expense that is not directly associated with the other segments, such as foreign exchange gains and losses.

	Three Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$53.8	\$22.4	\$31.4	140%
Operating loss	(38.5)	(49.1)	10.6	22%
Adjusted EBITDA	(33.4)	(45.1)	11.7	26%

Sales of \$53.8 increased 140%, or \$31.4, primarily due to higher LNG project activity. Operating loss of \$38.5 decreased 22%, or \$10.6, primarily due to the higher LNG project activity, partially offset by higher business development costs to support our growth strategy.

FIRST SIX MONTHS 2020 VS. FIRST SIX MONTHS 2019

FIRST SIX MONTHS 2020 IN SUMMARY

The results below are compared to the first six months of fiscal year 2019.

- Sales of \$4,471.0 increased 1%, or \$59.3, as higher volumes and positive pricing were mostly offset by lower energy and natural gas cost pass-through to customers, unfavorable currency, and the impact of a contract modification to a tolling arrangement in India.
- Operating income of \$1,138.2 increased 17%, or \$166.7, and operating margin of 25.5% increased 350 bp.
- Net income of \$979.3 increased 24%, or \$188.8, and net income margin of 21.9% increased 400 bp.
- Adjusted EBITDA of \$1,800.9 increased 11%, or \$181.2, and adjusted EBITDA margin of 40.3% increased 360 bp.
- Diluted EPS of \$4.36 increased 25%, or \$0.88. Adjusted diluted EPS of \$4.18 increased 11%, or \$0.40. A summary table of changes in diluted EPS is presented below.
- We increased our quarterly dividend by over 15% from \$1.16 to \$1.34 per share, representing the largest dividend increase in the Company's history. This is the 38th consecutive year that we have increased our quarterly dividend payment.

Changes in Diluted EPS

The per share impacts presented in the table below were calculated independently and may not sum to the total change in diluted EPS due to rounding.

	Six Months Ended 31 March		Increase (Decrease)
	2020	2019	
Diluted EPS attributable to Air Products	\$4.29	\$3.48	\$0.81
Diluted EPS from discontinued operations	(0.06)	—	(0.06)
Diluted EPS From Continuing Operations	\$4.36	\$3.48	\$0.88
Operating Impacts			
Underlying business			
Volume ^(A)			\$0.27
Price, net of variable costs			0.45
Other costs			(0.29)
Currency			(0.05)
Facility closure			0.10
Company headquarters relocation income (expense)			0.12
Total Operating Impacts			\$0.60
Other Impacts			
Equity affiliates' income			0.05
Interest expense			0.13
Other non-operating income (expense), net			(0.06)
Change in effective tax rate, excluding discrete items below			(0.04)
India Finance Act 2020			0.06
Tax reform repatriation			(0.07)
Tax reform adjustment related to deemed foreign dividends			0.25
Noncontrolling interests			(0.02)
Weighted average diluted shares			(0.02)
Total Other Impacts			\$0.28
Total Change in Diluted EPS From Continuing Operations			\$0.88

^(A) Includes an estimated negative impact of \$0.06-\$0.08 from COVID-19, primarily in our Asia merchant business.

	Six Months Ended 31 March		Increase (Decrease)
	2020	2019	
Diluted EPS From Continuing Operations	\$4.36	\$3.48	\$0.88
Facility closure	—	0.10	(0.10)
Company headquarters relocation (income) expense	(0.12)	—	(0.12)
India Finance Act 2020	(0.06)	—	(0.06)
Pension settlement loss	—	0.02	(0.02)
Tax reform repatriation	—	(0.07)	0.07
Tax reform adjustment related to deemed foreign dividends	—	0.25	(0.25)
Adjusted Diluted EPS From Continuing Operations	\$4.18	\$3.78	\$0.40

FIRST SIX MONTHS 2020 RESULTS OF OPERATIONS

Discussion of Consolidated Results

	Six Months Ended 31 March			
	2020	2019	\$ Change	Change
GAAP Measures				
Sales	\$4,471.0	\$4,411.7	\$59.3	1%
Operating income	1,138.2	971.5	166.7	17%
Operating margin	25.5%	22.0%		350 bp
Equity affiliates' income	146.4	99.1	47.3	48%
Net income	979.3	790.5	188.8	24%
Net income margin	21.9%	17.9%		400 bp
Non-GAAP Measures				
Adjusted EBITDA	1,800.9	1,619.7	181.2	11%
Adjusted EBITDA margin	40.3%	36.7%		360 bp

Consistent with our results discussion for the second quarter of 2020, the COVID-19 pandemic did not have a significant impact on our consolidated results of operations in the first half of fiscal year 2020. We will continue to evaluate the nature and extent of future impacts of COVID-19, particularly in our Industrial Gases – Americas and Industrial Gases – EMEA segments. Given the dynamic nature of these circumstances, the full impact of the COVID-19 pandemic on our ongoing business, results of operations, and overall financial performance cannot be reasonably estimated at this time.

Sales

Sales % Change from Prior Year

Volume	6 %
Price	3 %
Energy and natural gas cost pass-through	(5)%
Currency	(2)%
Other ^(A)	(1)%
Total Consolidated Sales Change	1 %

^(A) Includes the impact from the modification of a hydrogen supply contract to a tolling arrangement in India in December 2018 (the "India contract modification").

Sales of \$4,471.0 increased 1%, or \$59.3, as higher volumes of 6% and favorable pricing of 3% were mostly offset by lower energy and natural gas cost pass-through to customers of 5%, unfavorable currency of 2%, and the impact from the India contract modification of 1%. Both volume and price were higher across the regional segments. The volume growth was driven by our base business, new plants, and the carbon dioxide business we acquired in the prior year. The pricing improvement was attributable to our merchant business. Unfavorable currency impacts were driven by the Chinese Renminbi, Euro, and South Korean Won.

Cost of Sales and Gross Margin

Cost of sales of \$2,946.7 decreased 3%, or \$101.0, from total cost of sales of \$3,047.7 in the prior year, which included the facility closure further discussed below. The decrease from the prior year was driven by lower energy and natural gas cost pass-through to customers of \$209, positive currency impacts of \$54, the favorable impact from the India contract modification of \$41, and the facility closure of \$29 that occurred in the prior year, partially offset by higher costs attributable to sales volumes of \$195 and higher other costs of \$37. Gross margin of 34.1% increased 320 bp, primarily due to positive pricing, lower energy and natural gas cost pass-through to customers, and the facility closure that occurred in the prior year, partially offset by unfavorable net operating costs.

Facility Closure

In December 2018, one of our customers was subject to a government enforced shutdown due to environmental reasons. As a result, we recognized a charge of \$29.0 (\$22.1 after-tax, or \$0.10 per share) during the first quarter of fiscal year 2019 primarily related to the write-off of onsite assets. This charge is reflected as "Facility closure" on our consolidated income statements for the six months ended 31 March 2019.

Selling and Administrative Expense

Selling and administrative expense of \$403.4 increased 6%, or \$23.8, from investing in business development resources to support our growth strategy. Selling and administrative expense, as a percentage of sales, increased from 8.6% to 9.0%.

Research and Development

Research and development expense of \$36.9 increased 16%, or \$5.0. Research and development expense as a percentage of sales increased from 0.7% to 0.8%.

Company Headquarters Relocation Income (Expense)

During the second quarter of fiscal year 2020, we sold property at our current corporate headquarters located in Trexlertown, Pennsylvania, for net proceeds of \$44.1. The sale was completed in anticipation of relocating our U.S. headquarters and resulted in a gain of \$33.8 (\$25.6 after-tax, or \$0.12 per share). This gain is reflected on our consolidated income statements as "Company headquarters relocation income (expense)" for the six months ended 31 March 2020 and has been excluded from the results of the Corporate and other segment.

Other Income (Expense), Net

Other income (expense), net of \$20.4 increased 7%, or \$1.4.

Operating Income and Margin

Operating income of \$1,138.2 increased 17%, or \$166.7, due to positive pricing, net of power and fuel costs, of \$123, favorable volumes of \$75, income associated with the company headquarters relocation of \$34, and a charge for a facility closure of \$29 in the prior year, partially offset by higher net operating costs of \$79, including planned maintenance, and unfavorable currency of \$15. Operating margin of 25.5% increased 350 bp, primarily due to positive pricing and lower energy and natural gas cost pass-through to customers.

Equity Affiliates' Income

Equity affiliates' income of \$146.4 increased 48%, or \$47.3, primarily due to a current year benefit of \$33.8 for the release of our share of accumulated dividend distribution taxes related to an Indian affiliate as a result of the enactment of a tax law in India. Refer to Note 17, *Income Taxes*, to the consolidated financial statements for additional information. The current year also includes higher income from the Jazan Gas Projects Company joint venture.

Interest Expense

	Six Months Ended 31 March	
	2020	2019
Interest incurred	\$45.6	\$78.5
Less: capitalized interest	7.6	5.8
Interest expense	\$38.0	\$72.7

Interest incurred decreased 42%, or \$32.9. The prior year included \$17.4 of interest expense related to foreign currency forward points and currency swap basis differences of our cash flow hedges of intercompany loans. As discussed in Note 2, *New Accounting Guidance*, to the consolidated financial statements, we adopted new accounting guidance on hedging activities that changed the presentation of these items from "Interest expense, net" to "Other non-operating income (expense), net" in fiscal year 2020. In addition to this presentation change, interest expense decreased due to lower interest expense associated with financing the Lu'An joint venture and a lower average debt balance. Capitalized interest increased 31%, or \$1.8, due to an increase in the carrying value of projects under construction.

Other Non-Operating Income (Expense), net

Other non-operating income (expense), net of \$16.2 decreased 50%, or \$16.0, primarily due to the impact of the adoption of the guidance on hedging activities discussed above and lower interest income on cash and cash items, partially offset by higher non-service pension income. The prior year included a pension settlement loss of \$5.0 (\$3.8 after-tax, or \$0.02 per share) associated with the U.S. Supplementary Pension Plan.

Discontinued Operations

During the second quarter of fiscal year 2020, we recorded a pre-tax loss from discontinued operations of \$19.0 (\$14.3 after-tax, or \$0.06 per share) to increase our liability for retained environmental obligations associated with the sale of our former Amines business in September 2006. Refer to the Pace discussion within Note 13, *Commitments and Contingencies*, to the consolidated financial statements for additional information.

Net Income and Net Income Margin

Net income of \$979.3 increased 24%, or \$188.8, primarily due to positive pricing, higher volumes, and current year income associated with the company headquarters relocation, as well as the impacts from the facility closure and the U.S. Tax Cuts and Jobs Act in the prior year. These factors were partially offset by unfavorable costs, including the after-tax loss from discontinued operations. Net income margin of 21.9% increased 400 bp, primarily due to the factors noted above as well as lower energy and natural gas cost pass-through to customers.

Adjusted EBITDA and Adjusted EBITDA Margin

Adjusted EBITDA of \$1,800.9 increased 11%, or \$181.2, primarily due to positive pricing and higher volumes, partially offset by unfavorable operating costs. Adjusted EBITDA margin of 40.3% increased 360 bp, primarily due to the factors noted above as well as lower energy and natural gas cost pass-through to customers.

Effective Tax Rate

The effective tax rate was 21.3% and 23.3% for the six months ended 31 March 2020 and 2019, respectively. The higher 2019 tax rate reflected a discrete net income tax expense of \$40.6 related to impacts from the U.S. Tax Cuts and Jobs Act (the "Tax Act"). The net expense included the reversal of a non-recurring \$56.2 (\$0.25 per share) benefit recorded in 2018 related to the U.S. taxation of deemed foreign dividends. This was partially offset by a benefit of \$15.6 (\$0.07 per share) to finalize our estimates of the impacts of the Tax Act and reduce the total expected costs of the deemed repatriation tax. These prior year impacts were partially offset by beneficial changes in foreign tax law and changes in valuation allowance recorded at various entities in 2019.

The current year rate was impacted by the enactment of India Finance Act 2020, which resulted in additional net income of \$13.5 (\$0.06 per share). This included an increase to equity affiliates' income of \$33.8, partially offset by an increase to our income tax provision of \$20.3 for changes in the future tax costs of repatriated earnings. This cost was partially offset by higher excess tax benefits on share-based compensation in the six months ended 31 March 2020.

The adjusted effective tax rate increased from 19.5% in fiscal year 2019 to 20.1% in fiscal year 2020. This increase was primarily driven by beneficial changes in foreign tax law and changes in valuation allowance recorded at various entities in 2019, partially offset by higher excess tax benefits on share-based compensation for the six months ended 31 March 2020.

Refer to Note 17, *Income Taxes*, to the consolidated financial statements for additional information.

Segment Analysis

Industrial Gases – Americas

	Six Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$1,868.6	\$1,980.9	(\$112.3)	(6)%
Operating income	525.2	474.8	50.4	11 %
Operating margin	28.1%	24.0%		410 bp
Equity affiliates' income	42.2	40.4	1.8	4 %
Adjusted EBITDA	834.7	765.7	69.0	9 %
Adjusted EBITDA margin	44.7%	38.7%		600 bp

Sales % Change from Prior Year

Volume	1 %
Price	3 %
Energy and natural gas cost pass-through	(9)%
Currency	(1)%
Total Industrial Gases – Americas Sales Change	(6)%

Sales of \$1,868.6 decreased 6%, or \$112.3, as lower energy and natural gas cost pass-through of 9% and a negative impact from currency of 1% were only partially offset by positive pricing of 3% and higher volumes of 1%. The pricing improvement was driven by our merchant business.

The COVID-19 pandemic began impacting our merchant business at the end of March 2020. We expect these volume impacts to continue and be more significant in the third quarter. Additionally, we expect North America maintenance activities that were previously planned for the second half of the year to be delayed due to the COVID-19 pandemic.

Operating income of \$525.2 increased 11%, or \$50.4, primarily due to higher pricing, net of power and fuel costs, of \$51 and favorable volumes of \$18, partially offset by higher net operating costs of \$17. Operating margin of 28.1% increased 410 bp, primarily due to lower energy and natural gas cost pass-through to customers and positive pricing.

Equity affiliates' income of \$42.2 increased 4%, or \$1.8.

Industrial Gases – EMEA

	Six Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$991.4	\$1,018.6	(\$27.2)	(3)%
Operating income	245.1	228.1	17.0	7 %
Operating margin	24.7%	22.4%		230 bp
Equity affiliates' income	32.8	27.0	5.8	21 %
Adjusted EBITDA	373.9	347.7	26.2	8 %
Adjusted EBITDA margin	37.7%	34.1%		360 bp

Sales % Change from Prior Year

Volume	5 %
Price	3 %
Energy and natural gas cost pass-through	(5)%
Currency	(2)%
Other ^(A)	(4)%
Total Industrial Gases – EMEA Sales Change	(3)%

^(A) Includes the impact from the modification of a hydrogen supply contract to a tolling arrangement in India in December 2018 (the "India contract modification").

Sales of \$991.4 decreased 3%, or \$27.2, as lower energy and natural gas cost pass-through to customers of 5%, the negative impact from the India contract modification of 4%, and unfavorable currency impacts of 2% were only partially offset by favorable volumes of 5% and positive pricing of 3%. Volumes increased primarily due to new projects, demand for hydrogen in our Rotterdam pipeline system, and the carbon dioxide business we acquired in the second quarter of fiscal year 2019. The pricing improvement was attributable to our merchant business. The negative currency impact was mainly driven by the Euro.

The COVID-19 pandemic began impacting our merchant business at the end of March 2020. We expect these volume impacts to continue and be more significant in the third quarter, particularly in our merchant packaged gases business, which is characterized by smaller, more economically sensitive customers.

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Operating income of \$245.1 increased 7%, or \$17.0, due to higher pricing, net of power and fuel costs, of \$40 and favorable volumes of \$4, partially offset by higher costs of \$22 and unfavorable currency impacts of \$5. Operating margin of 24.7% increased 230 bp, primarily due to favorable pricing, lower energy and natural gas cost pass-through to customers, and the India contract modification, partially offset by higher costs.

Equity affiliates' income of \$32.8 increased 21%, or \$5.8, primarily due to the Jazan Gas Projects Company joint venture.

Industrial Gases – Asia

	Six Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$1,350.9	\$1,252.2	\$98.7	8%
Operating income	437.6	401.5	36.1	9%
Operating margin	32.4%	32.1%		30 bp
Equity affiliates' income	30.7	30.0	0.7	2%
Adjusted EBITDA	674.0	596.3	77.7	13%
Adjusted EBITDA margin	49.9%	47.6%		230 bp

Sales % Change from Prior Year

Volume	7 %
Price	3 %
Energy and natural gas cost pass-through	— %
Currency	(2)%
Total Industrial Gases – Asia Sales Change	8 %

Sales of \$1,350.9 increased 8%, or \$98.7, as higher volumes of 7% and positive pricing of 3% were partially offset by unfavorable currency impacts of 2%. Volumes increased primarily due to a short-term supply contract, new plants, and base business growth. Merchant volumes were negatively impacted from COVID-19 for approximately six weeks after the Lunar New Year holiday before recovering to normal levels in late March 2020. Pricing improved across Asia, driven by our merchant business. The unfavorable currency impact was primarily attributable to the Chinese Renminbi and the South Korean Won. Energy and natural gas cost pass-through to customers was flat versus the prior year.

Operating income of \$437.6 increased 9%, or \$36.1, due to positive pricing, net of power and fuel costs, of \$31 and favorable volumes of \$22, partially offset by unfavorable currency impacts of \$9 and higher net operating costs of \$8. Operating margin of 32.4% increased 30 bp, primarily due to positive pricing, partially offset by higher net operating costs.

Equity affiliates' income of \$30.7 increased 2%, or \$0.7.

Industrial Gases – Global

	Six Months Ended 31 March		\$ Change	% Change
	2020	2019		
Sales	\$171.9	\$122.0	\$49.9	41 %
Operating loss	(16.2)	(8.3)	(7.9)	(95)%
Adjusted EBITDA	(4.5)	(2.5)	(2.0)	(80)%

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Sales of \$171.9 increased 41%, or \$49.9, primarily due to higher sale of equipment activity. Operating loss of \$16.2 increased 95%, or \$7.9, as higher project development costs were only partially offset by higher sale of equipment and other project activity.

Corporate and other

	Six Months Ended 31 March			
	2020	2019	\$ Change	% Change
Sales	\$88.2	\$38.0	\$50.2	132%
Operating loss	(87.3)	(95.6)	8.3	9%
Adjusted EBITDA	(77.2)	(87.5)	10.3	12%

Sales of \$88.2 increased 132%, or \$50.2, primarily due to higher LNG project activity. Operating loss of \$87.3 decreased 9%, or \$8.3, primarily due to the higher LNG project activity, partially offset by higher business development costs to support our growth strategy.

RECONCILIATIONS OF NON-GAAP FINANCIAL MEASURES

(Millions of dollars unless otherwise indicated, except for per share data)

The Company presents certain financial measures, other than in accordance with U.S. generally accepted accounting principles ("GAAP"), on an "adjusted" or "non-GAAP" basis. On a consolidated basis, these measures include adjusted diluted earnings per share ("EPS"), adjusted EBITDA, adjusted EBITDA margin, and adjusted effective tax rate. On a segment basis, these measures include adjusted EBITDA and adjusted EBITDA margin. In addition to these measures, which are presented above, we also include certain supplemental non-GAAP financial measures that are presented below to help the reader understand the impact that our non-GAAP adjustments have on the calculation of our adjusted diluted EPS. For each non-GAAP financial measure, we present below a reconciliation to the most directly comparable financial measure calculated in accordance with GAAP.

The Company's non-GAAP measures are not meant to be considered in isolation or as a substitute for the most directly comparable measure calculated in accordance with GAAP. The Company believes these non-GAAP measures provide investors, potential investors, securities analysts, and others with useful information to evaluate the performance of the business because such measures, when viewed together with financial results computed in accordance with GAAP, provide a more complete understanding of the factors and trends affecting the Company's historical financial performance and projected future results.

In many cases, non-GAAP measures are determined by adjusting the most directly comparable GAAP measure to exclude certain disclosed items, or "non-GAAP adjustments," that the Company believes are not representative of underlying business performance. For example, the Company previously excluded certain expenses associated with cost reduction actions, impairment charges, and gains on disclosed transactions. The reader should be aware that the Company may recognize similar losses or gains in the future. Readers should also consider the limitations associated with these non-GAAP measures, including the potential lack of comparability of these measures from one company to another.

The tax impact on our pre-tax non-GAAP adjustments reflects the expected current and deferred income tax impact of our non-GAAP adjustments. These tax impacts are primarily driven by the statutory tax rate of the various relevant jurisdictions and the taxability of the adjustments in those jurisdictions.

ADJUSTED DILUTED EPS

The table below provides a reconciliation to the most directly comparable GAAP measure for each of the major components used to calculate adjusted diluted EPS from continuing operations, which the Company views as a key performance metric. We believe it is important for the reader to understand the per share impact of our non-GAAP adjustments as management does not consider these impacts when evaluating underlying business performance.

Q2 2020 vs. Q2 2019	Continuing Operations				
	Three Months Ended 31 March				
	Operating Income	Equity Affiliates' Income	Income Tax Provision	Net Income Attributable to Air Products	Diluted EPS(A)
2020 GAAP	\$577.2	\$88.2	\$148.5	\$492.1	\$2.21
2019 GAAP	516.5	46.2	107.5	421.3	1.90
Change GAAP				\$70.8	\$0.31
% Change GAAP				17%	16%
2020 GAAP	\$577.2	\$88.2	\$148.5	\$492.1	\$2.21
Company headquarters relocation (income) expense	(33.8)	—	(8.2)	(25.6)	(0.12)
India Finance Act 2020	—	(33.8)	(20.3)	(13.5)	(0.06)
2020 Non-GAAP Measure ("Adjusted")	\$543.4	\$54.4	\$120.0	\$453.0	\$2.04
2019 GAAP	\$516.5	\$46.2	\$107.5	\$421.3	\$1.90
Pension settlement loss(B)	—	—	1.2	3.8	0.02
2019 Non-GAAP Measure ("Adjusted")	\$516.5	\$46.2	\$108.7	\$425.1	\$1.92
Change Non-GAAP Measure ("Adjusted")				\$27.9	\$0.12
% Change Non-GAAP Measure ("Adjusted")				7%	6%

(A) The per share impact for each of our non-GAAP adjustments was calculated independently and may not sum to total adjusted diluted EPS due to rounding.

(B) Reflected on the consolidated income statements within "Other non-operating income (expense), net." Fiscal year 2019 includes a before-tax impact of \$5.0 for the three months ended 31 March 2019.

	Continuing Operations				
	Six Months Ended 31 March				
2020 vs. 2019	Operating Income	Equity Affiliates' Income	Income Tax Provision	Net Income Attributable to Air Products	Diluted EPS
2020 GAAP	\$1,138.2	\$146.4	\$269.2	\$967.7	\$4.36
2019 GAAP	971.5	99.1	239.6	768.8	3.48
Change GAAP				\$198.9	\$0.88
% Change GAAP				26%	25%
2020 GAAP	\$1,138.2	\$146.4	\$269.2	\$967.7	\$4.36
Company headquarters relocation (income) expense	(33.8)	—	(8.2)	(25.6)	(0.12)
India Finance Act 2020	—	(33.8)	(20.3)	(13.5)	(0.06)
2020 Non-GAAP Measure ("Adjusted")	\$1,104.4	\$112.6	\$240.7	\$928.6	\$4.18
2019 GAAP	\$971.5	\$99.1	\$239.6	\$768.8	\$3.48
Facility closure	29.0	—	6.9	22.1	0.10
Pension settlement loss(B)	—	—	1.2	3.8	0.02
Tax reform repatriation	—	—	15.6	(15.6)	(0.07)
Tax reform adjustment related to deemed foreign dividends	—	—	(56.2)	56.2	0.25
2019 Non-GAAP Measure ("Adjusted")	\$1,000.5	\$99.1	\$207.1	\$835.3	\$3.78
Change Non-GAAP Measure ("Adjusted")				\$93.3	\$0.40
% Change Non-GAAP Measure ("Adjusted")				11%	11%

(B) Reflected on the consolidated income statements within "Other non-operating income (expense), net." Fiscal year 2019 includes a before-tax impact of \$5.0 for the six months ended 31 March 2019.

ADJUSTED EBITDA AND ADJUSTED EBITDA MARGIN

We define adjusted EBITDA as net income less income (loss) from discontinued operations, net of tax, and excluding certain non-GAAP adjustments, which the Company does not believe to be indicative of underlying business trends, before interest expense, other non-operating income (expense), net, income tax provision, and depreciation and amortization expense. Adjusted EBITDA and adjusted EBITDA margin provide useful metrics for management to assess operating performance. Margins are calculated independently for each period by dividing each line item by consolidated sales for the respective period and may not sum to total margin due to rounding.

Below is a presentation of consolidated sales and a reconciliation of net income on a GAAP basis to adjusted EBITDA and net income margin on a GAAP basis to adjusted EBITDA margin:

	Three Months Ended 31 March				Six Months Ended 31 March			
	2020		2019		2020		2019	
	\$	Margin	\$	Margin	\$	Margin	\$	Margin
Sales	\$2,216.3		\$2,187.7		\$4,471.0		\$4,411.7	
Net income and net income margin	\$490.4	22.1%	\$433.5	19.8%	\$979.3	21.9%	\$790.5	17.9%
Less: Loss from discontinued operations, net of tax	(14.3)	(0.6)%	—	—%	(14.3)	(0.3)%	—	—%
Add: Interest expense	19.3	0.9 %	35.4	1.6%	38.0	0.9 %	72.7	1.6%
Less: Other non-operating income (expense), net	7.1	0.3 %	13.7	0.6%	16.2	0.4 %	32.2	0.7%
Add: Income tax provision	148.5	6.7 %	107.5	4.9%	269.2	6.0 %	239.6	5.4%
Add: Depreciation and amortization	294.7	13.3 %	262.1	12.0%	583.9	13.1 %	520.1	11.8%
Add: Facility closure	—	—%	—	—%	—	—%	29.0	0.7%
Less: Company headquarters relocation income (expense)	33.8	1.5 %	—	—%	33.8	0.8 %	—	—%
Less: India Finance Act 2020 - equity affiliate income impact	33.8	1.5 %	—	—%	33.8	0.8 %	—	—%
Adjusted EBITDA and adjusted EBITDA margin	\$892.5	40.3%	\$824.8	37.7%	\$1,800.9	40.3%	\$1,619.7	36.7%
2020 vs. 2019								
Change GAAP								
Net income \$ change		\$56.9				\$188.8		
Net income % change		13%				24%		
Net income margin change		230 bp				400 bp		
Change Non-GAAP								
Adjusted EBITDA \$ change		\$67.7				\$181.2		
Adjusted EBITDA % change		8%				11%		
Adjusted EBITDA margin change		260 bp				360 bp		

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Below is a reconciliation of operating income and operating margin by segment to adjusted EBITDA and adjusted EBITDA margin by segment for the three months ended 31 March 2020 and 2019:

	Industrial Gases— Americas	Industrial Gases— EMEA	Industrial Gases— Asia	Industrial Gases— Global	Corporate and other	Total
GAAP MEASURES						
Three Months Ended 31 March 2020						
Operating income (loss)	\$268.0	\$124.6	\$209.1	(\$19.8)	(\$38.5)	\$543.4 ^(A)
Operating margin	28.7%	25.3%	31.8%			
Three Months Ended 31 March 2019						
Operating income (loss)	\$255.6	\$122.5	\$199.7	(\$12.2)	(\$49.1)	\$516.5 ^(A)
Operating margin	25.8%	24.8%	31.9%			
Operating income (loss) \$ change	\$12.4	\$2.1	\$9.4	(\$7.6)	\$10.6	
Operating income (loss) % change	5%	2%	5%	(62)%	22%	
Operating margin change	290 bp	50 bp	(10) bp			
NON-GAAP MEASURES						
Three Months Ended 31 March 2020						
Operating income (loss)	\$268.0	\$124.6	\$209.1	(\$19.8)	(\$38.5)	\$543.4 ^(A)
Add: Depreciation and amortization	135.5	47.6	104.1	2.4	5.1	294.7
Add: Equity affiliates' income	21.6	13.5	13.8	5.5	—	54.4 ^(B)
Adjusted EBITDA	\$425.1	\$185.7	\$327.0	(\$11.9)	(\$33.4)	\$892.5
Adjusted EBITDA margin	45.6%	37.7%	49.7%			
Three Months Ended 31 March 2019						
Operating income (loss)	\$255.6	\$122.5	\$199.7	(\$12.2)	(\$49.1)	\$516.5 ^(A)
Add: Depreciation and amortization	124.9	46.3	84.9	2.0	4.0	262.1
Add: Equity affiliates' income	17.8	13.3	13.8	1.3	—	46.2 ^(B)
Adjusted EBITDA	\$398.3	\$182.1	\$298.4	(\$8.9)	(\$45.1)	\$824.8
Adjusted EBITDA margin	40.2%	36.8%	47.7%			
Adjusted EBITDA \$ change	\$26.8	\$3.6	\$28.6	(\$3.0)	\$11.7	
Adjusted EBITDA % change	7%	2%	10%	(34)%	26%	
Adjusted EBITDA margin change	540 bp	90 bp	200 bp			

	Industrial Gases— Americas	Industrial Gases— EMEA	Industrial Gases— Asia	Industrial Gases— Global	Corporate and other	Total
GAAP MEASURE						
Six Months Ended 31 March 2020						
Operating income (loss)	\$525.2	\$245.1	\$437.6	(\$16.2)	(\$87.3)	\$1,104.4 ^(A)
Operating margin	28.1%	24.7%	32.4%			
Six Months Ended 31 March 2019						
Operating income (loss)	\$474.8	\$228.1	\$401.5	(\$8.3)	(\$95.6)	\$1,000.5 ^(A)
Operating margin	24.0%	22.4%	32.1%			
Operating income (loss) \$ change	\$50.4	\$17.0	\$36.1	(\$7.9)	\$8.3	
Operating income (loss) % change	11%	7%	9%	(95)%	9%	
Operating margin change	410 bp	230 bp	30 bp			
NON-GAAP MEASURE						
Six Months Ended 31 March 2020						
Operating income (loss)	\$525.2	\$245.1	\$437.6	(\$16.2)	(\$87.3)	\$1,104.4 ^(A)
Add: Depreciation and amortization	267.3	96.0	205.7	4.8	10.1	583.9
Add: Equity affiliates' income	42.2	32.8	30.7	6.9	—	112.6 ^(B)
Adjusted EBITDA	\$834.7	\$373.9	\$674.0	(\$4.5)	(\$77.2)	\$1,800.9
Adjusted EBITDA margin	44.7%	37.7%	49.9%			
Six Months Ended 31 March 2019						
Operating income (loss)	\$474.8	\$228.1	\$401.5	(\$8.3)	(\$95.6)	\$1,000.5 ^(A)
Add: Depreciation and amortization	250.5	92.6	164.8	4.1	8.1	520.1
Add: Equity affiliates' income	40.4	27.0	30.0	1.7	—	99.1 ^(B)
Adjusted EBITDA	\$765.7	\$347.7	\$596.3	(\$2.5)	(\$87.5)	\$1,619.7
Adjusted EBITDA margin	38.7%	34.1%	47.6%			
Adjusted EBITDA \$ change	\$69.0	\$26.2	\$77.7	(\$2.0)	\$10.3	
Adjusted EBITDA % change	9%	8%	13%	(80)%	12%	
Adjusted EBITDA margin change	600 bp	360 bp	230 bp			

(A) The table below reconciles operating income as reflected on our consolidated income statements to total operating income in the table above:

	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
Operating Income				
Consolidated operating income	\$577.2	\$516.5	\$1,138.2	\$971.5
Facility closure	—	—	—	29.0
Company headquarters relocation (income) expense	(33.8)	—	(33.8)	—
Total	\$543.4	\$516.5	\$1,104.4	\$1,000.5

(B) The table below reconciles equity affiliates' income as reflected on our consolidated income statements to total equity affiliates' income in the table above:

	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
Equity Affiliates' Income				
Consolidated equity affiliates' income	\$88.2	\$46.2	\$146.4	\$99.1
India Finance Act 2020	(33.8)	—	(33.8)	—
Total	\$54.4	\$46.2	\$112.6	\$99.1

ADJUSTED EFFECTIVE TAX RATE

The tax impact of our pre-tax non-GAAP adjustments reflects the expected current and deferred income tax expense associated with each adjustment and is primarily dependent upon the statutory tax rate of the various relevant jurisdictions and the taxability of the adjustments in those jurisdictions. For additional discussion on the impacts of India Finance Act 2020 and the U.S. Tax Cuts and Jobs Act, refer to Note 17, *Income Taxes*, to the consolidated financial statements.

	Three Months Ended 31 March		Six Months Ended 31 March	
	2020	2019	2020	2019
Income Tax Provision	\$148.5	\$107.5	\$269.2	\$239.6
Income From Continuing Operations Before Taxes	\$653.2	\$541.0	\$1,262.8	\$1,030.1
Effective Tax Rate	22.7%	19.9%	21.3%	23.3%
Income Tax Provision	\$148.5	\$107.5	\$269.2	\$239.6
Facility closure	—	—	—	6.9
Company headquarters relocation	(8.2)	—	(8.2)	—
India Finance Act 2020	(20.3)	—	(20.3)	—
Pension settlement loss	—	1.2	—	1.2
Tax reform repatriation	—	—	—	15.6
Tax reform adjustment related to deemed foreign dividends	—	—	—	(56.2)
Adjusted Income Tax Provision	\$120.0	\$108.7	\$240.7	\$207.1
Income From Continuing Operations Before Taxes	\$653.2	\$541.0	\$1,262.8	\$1,030.1
Facility closure	—	—	—	29.0
Company headquarters relocation (income) expense	(33.8)	—	(33.8)	—
India Finance Act 2020 - equity affiliate income impact	(33.8)	—	(33.8)	—
Pension settlement loss	—	5.0	—	5.0
Adjusted Income From Continuing Operations Before Taxes	\$585.6	\$546.0	\$1,195.2	\$1,064.1
Adjusted Effective Tax Rate	20.5%	19.9%	20.1%	19.5%

LIQUIDITY AND CAPITAL RESOURCES

Our cash balance and cash flows from operations are our primary sources of liquidity and are generally sufficient to meet our liquidity needs. In addition, we have the flexibility to access capital through a variety of financing activities, including accessing the capital markets, drawing upon our credit facility, or alternatively, accessing the commercial paper markets. At this time, we have not utilized, nor do we expect to access, our credit facility for additional liquidity. In addition, we have considered the impacts of COVID-19 on our liquidity and capital resources and do not expect it to impact our ability to meet future liquidity needs.

As of 31 March 2020, we had \$1,206.2 of foreign cash and cash items compared to total cash and cash items of \$2,220.1. As a result of the Tax Act, we currently do not expect that a significant portion of the earnings of our foreign subsidiaries and affiliates will be subject to U.S. income tax upon subsequent repatriation to the U.S. Depending on the country in which the subsidiaries and affiliates reside, the repatriation of these earnings may be subject to foreign withholding and other taxes. However, since we have significant current investment plans outside the U.S., it is our intent to permanently reinvest the majority of our foreign cash and cash items that would be subject to additional taxes outside the U.S.

Our cash flows from operating, investing, and financing activities, as reflected on the consolidated statements of cash flows, are summarized in the following table:

Cash provided by (used for)	Six Months Ended 31 March	
	2020	2019
Operating activities	\$1,238.5	\$1,285.8
Investing activities	(706.4)	(882.1)
Financing activities	(537.8)	(459.8)

Operating Activities

For the first six months of fiscal year 2020, cash provided by operating activities was \$1,238.5. Income from continuing operations of \$967.7 was adjusted for items including depreciation and amortization, deferred income taxes, undistributed earnings of unconsolidated affiliates, gains on sale of assets and investments, share-based compensation, and noncurrent lease receivables. We recorded a net benefit of \$13.5 on our consolidated income statements related to an India tax law change during the quarter. This net benefit, which is further discussed in Note 17, *Income Taxes*, to the consolidated financial statements, increased "Undistributed earnings of unconsolidated affiliates" by \$33.8 and increased "Deferred income taxes" by \$20.3. The "Gain on sale of assets and investments" of \$40.5 includes a gain of \$33.8 related to the sale of property at our current corporate headquarters. Refer to Note 18, *Supplemental Information*, to the consolidated financial statements for additional information. The working capital accounts were a use of cash of \$354.0, primarily driven by \$113.1 from other working capital, \$111.9 from trade receivables, less allowances, and \$111.8 from payables and accrued liabilities. The use within "Other working capital" was primarily due to higher tax payments and increases in contract assets and contract fulfillment costs associated with revenue generating project activity. The use of cash within "Trade receivables, less allowances" includes progress billings associated with sale of equipment activity. The use of cash within "Payables and accrued liabilities" was primarily driven by a \$56.0 decrease in accrued incentive compensation due to payments on the 2019 annual incentive compensation plan and \$31.5 from the maturity of a forward exchange contract that hedged a foreign currency exposure.

For the first six months of fiscal year 2019, cash provided by operating activities was \$1,285.8 which includes income from continuing operations of \$768.8. The working capital accounts were a use of cash of \$141.6, primarily driven by \$125.5 from payables and accrued liabilities and \$55.4 from trade receivables. The use of cash within payables and accrued liabilities is primarily driven by a \$61.9 decrease in accrued incentive compensation due to payments on the 2018 plan and a \$24.9 decrease in accrued utilities. The decrease in accrued utilities was primarily driven by a contract modification to a tolling arrangement in India in December 2018.

Cash paid for income taxes, net of cash refunds, was \$253.5 and \$165.6 for the six months ended 31 March 2020 and 2019, respectively.

Investing Activities

For the first six months of fiscal year 2020, cash used for investing activities was \$706.4. Capital expenditures for plant and equipment were \$930.6. Proceeds from investments of \$177.0 resulted from maturities of time deposits with original terms greater than three months but less than one year. Proceeds from sale of assets and investments of \$68.0 includes net proceeds of \$44.1 related to the sale of property at our current corporate headquarters.

For the first six months of fiscal year 2019, cash used for investing activities was \$882.1. Capital expenditures for plant and equipment were \$963.5. Cash paid for acquisitions, less cash acquired, was \$106.3. See Note 6, *Acquisitions*, to the consolidated financial statements for further details regarding our acquisitions. Proceeds from investments of \$187.9 resulted from maturities of time deposits with original terms greater than three months but less than one year.

Capital expenditures is a non-GAAP measure that we define as cash flows for additions to plant and equipment, acquisitions (less cash acquired), and investment in and advances to unconsolidated affiliates. A reconciliation of cash used for investing activities to our reported capital expenditures is provided below.

	Six Months Ended 31 March	
	2020	2019
Cash used for investing activities	\$706.4	\$882.1
Proceeds from sale of assets and investments	68.0	3.8
Purchases of investments	—	(5.3)
Proceeds from investments	177.0	187.9
Other investing activities	1.9	2.7
Capital Expenditures	\$953.3	\$1,071.2

The components of our capital expenditures are detailed in the table below:

	Six Months Ended 31 March	
	2020	2019
Additions to plant and equipment	\$930.6	\$963.5
Acquisitions, less cash acquired	—	106.3
Investment in and advances to unconsolidated affiliates	22.7	1.4
Capital Expenditures	\$953.3	\$1,071.2

Due to the significant uncertainty that remains regarding the duration of the COVID-19 crisis, the pace of recovery, and its negative impact on the global economy, Air Products is not providing capital expenditure guidance for fiscal year 2020. Previously disclosed capital expenditure guidance should no longer be relied upon. We are monitoring our projects to determine whether capital spending and project onstream timing may be delayed for those currently under construction.

Investing Activities – Subsequent Event

On 17 April 2020, Air Products acquired five operating hydrogen production plants from PBF Energy Inc. for \$530 and has commenced the long-term supply of hydrogen from those plants to PBF refineries.

Financing Activities

For the first six months of fiscal year 2020, cash used for financing activities was \$537.8 and primarily included dividend payments to shareholders of \$511.7.

For the first six months of fiscal year 2019, cash used for financing activities was \$459.8 and primarily included dividend payments to shareholders of \$483.1, partially offset by proceeds from stock option exercises of \$45.4.

Financing and Capital Structure

Capital needs for the first six months of fiscal year 2020 were satisfied primarily with cash from operations. Total debt as of 31 March 2020 and 30 September 2019, expressed as a percentage of total capitalization (total debt plus total equity), was 22.0% and 22.6%, respectively. Total debt decreased from \$3,326.0 at 30 September 2019 to \$3,312.6 at 31 March 2020. The current year total debt balance includes \$361.2 of related party debt associated with the Lu'An joint venture.

We have a \$2,300.0 revolving credit agreement with a syndicate of banks (the "Credit Agreement") maturing 31 March 2022. Under the Credit Agreement, senior unsecured debt is available to both the Company and certain of its subsidiaries. The Credit Agreement provides a source of liquidity for the Company and supports its commercial paper program. The Company's only financial covenant is a maximum ratio of total debt to total capitalization no greater than 70%. No borrowings were outstanding under the Credit Agreement as of 31 March 2020 or 30 September 2019.

There were no outstanding commitments maintained by our foreign subsidiaries as of 31 March 2020.

As of 31 March 2020, we were in compliance with all of the financial and other covenants under our debt agreements.

On 15 September 2011, the Board of Directors authorized the repurchase of up to \$1,000 of our outstanding common stock. During the first six months of fiscal year 2020, we did not purchase any of our outstanding shares. At 31 March 2020, \$485.3 in share repurchase authorization remained.

Dividends

On 23 January 2019, the Board of Directors declared the second quarter dividend of \$1.34 per share. The dividend is payable on 11 May 2020 to shareholders of record at the close of business on 1 April 2020.

CONTRACTUAL OBLIGATIONS

We are obligated to make future payments under various contracts, such as debt agreements, lease agreements, unconditional purchase obligations, and other long-term obligations. There have been no material changes to our contractual obligations since 30 September 2019.

PENSION BENEFITS

For the six months ended 31 March 2020 and 2019, net periodic pension cost was \$2.3 and \$17.0, respectively. We recognized service-related costs of \$23.7 and \$20.9, respectively, on our consolidated income statements within operating income. The non-service related benefits of \$21.4 and \$3.9 were included in "Other non-operating income (expense), net" for the six months ended 31 March 2020 and 2019, respectively. The decrease in pension expense in fiscal year 2020 resulted from lower interest cost and higher expected return on assets, partially offset by higher loss amortization, primarily due to the impact of lower discount rates. The amount of service costs capitalized in the first six months of fiscal years 2020 and 2019 were not material.

For the six months ended 31 March 2020 and 2019, we recognized pension settlement losses of \$1.5 and \$6.0, respectively, to accelerate recognition of a portion of actuarial gains and losses deferred in accumulated other comprehensive loss. These losses are included within "Other non-operating income (expense), net" on our consolidated income statements. Pension settlement losses in fiscal years 2020 and 2019 were primarily associated with the U.S. supplementary pension plan. We expect total pension settlement losses of approximately \$5 to \$10 in fiscal year 2020.

Management considers various factors when making pension funding decisions, including tax, cash flow, and regulatory implications. For the six months ended 31 March 2020 and 2019, our cash contributions to funded pension plans and benefit payments for unfunded pension plans were \$14.9 and \$25.5, respectively. Total contributions for fiscal year 2020 are expected to be approximately \$30 to \$40. We do not expect COVID-19 to impact our contribution forecast for fiscal year 2020. During fiscal year 2019, total contributions were \$40.2.

Refer to Note 12, *Retirement Benefits*, to the consolidated financial statements for details on pension cost and cash contributions.

COMMITMENTS AND CONTINGENCIES

Refer to Note 13, *Commitments and Contingencies*, to the consolidated financial statements for information concerning our commitments and contingencies, including litigation and environmental matters.

OFF-BALANCE SHEET ARRANGEMENTS

There have been no material changes to off-balance sheet arrangements since 30 September 2019. We are not a primary beneficiary in any material variable interest entity. Our off-balance sheet arrangements are not reasonably likely to have a material impact on financial condition, changes in financial condition, results of operations, or liquidity.

RELATED PARTY TRANSACTIONS

See Note 18, *Supplemental Information*, to the consolidated financial statements for information concerning activity with our related parties.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Management's Discussion and Analysis of our financial condition and results of operations is based on the consolidated financial statements and accompanying notes that have been prepared in accordance with GAAP. The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Judgments and estimates of uncertainties are required in applying our accounting policies in many areas. However, application of policies that management has identified as critical places significant importance on management's judgment, often as the result of the need to make estimates of matters that are inherently uncertain. If actual results were to differ materially from these estimates, the reported results could be materially affected. A description of our major accounting policies, including those identified as critical, is included in our 2019 Form 10-K.

There have been no changes to our accounting policies or estimates during the first six months of fiscal year 2020 that had a significant impact on our financial condition, change in financial condition, liquidity, or results of operations.

Our operations have not been materially affected by the COVID-19 pandemic as of and for the three and six months ended 31 March 2020. As such, we concluded that a triggering event, which would require interim impairment testing for any of our asset groups, indefinite-lived intangible assets, or reporting units that contain goodwill, did not occur. While volumes in our Asia merchant business recovered to normal levels in March 2020, volume reductions in our merchant businesses in the Americas and EMEA region began at the end of March and are expected to continue and be more significant into the third quarter. We will continue to evaluate the nature and extent of these impacts on our business and any impact they may have on management's estimates, particularly those for our Latin America reporting unit. The duration and severity of the outbreak and its long-term impact on our business is uncertain at this time.

NEW ACCOUNTING GUIDANCE

See Note 2, *New Accounting Guidance*, and Note 9, *Leases*, to the consolidated financial statements for information concerning the implementation and impact of new accounting guidance.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

Information on our utilization of financial instruments and an analysis of the sensitivity of these instruments to selected changes in market rates and prices is included in our 2019 Form 10-K.

Our net financial instrument position decreased from a liability of \$3,239.1 at 30 September 2019 to a liability of \$3,154.1 at 31 March 2020.

Interest Rate Risk

The sensitivity analysis related to the interest rate risk on the fixed portion of our debt portfolio assumes an instantaneous 100 bp move in interest rates from the level at 31 March 2020, with all other variables held constant. A 100 bp increase in market interest rates would result in a decrease of \$67 and \$75 in the net liability position of financial instruments at 31 March 2020 and 30 September 2019, respectively. A 100 bp decrease in market interest rates would result in an increase of \$71 and \$80 in the net liability position of financial instruments at 31 March 2020 and 30 September 2019.

There were no material changes to the sensitivity analysis related to the variable portion of our debt portfolio since 30 September 2019.

Foreign Currency Exchange Rate Risk

The sensitivity analysis related to foreign currency exchange rates assumes an instantaneous 10% change in foreign currency exchange rates from their levels at 31 March 2020, with all other variables held constant. A 10% strengthening or weakening of the functional currency of an entity versus all other currencies would result in a decrease or increase, respectively, of \$263 and \$326 in the net liability position of financial instruments at 31 March 2020 and 30 September 2019, respectively.

COVID-19 Risks and Uncertainties

Refer to *Item 1A. Risk Factors* within this Quarterly Report on Form 10-Q for additional discussion of current and potential risks of the COVID-19 pandemic on our business and financial performance.

Item 4. Controls and Procedures

Disclosure Controls and Procedures

We maintain a comprehensive set of disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Under the supervision of the Chief Executive Officer and Chief Financial Officer, the Company's management conducted an evaluation of the effectiveness of the Company's disclosure controls and procedures as of 31 March 2020. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that, as of 31 March 2020, the disclosure controls and procedures were effective.

Internal Control Over Financial Reporting

There was no change in the Company's internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the quarter ended 31 March 2020 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1A. Risk Factors

We are supplementing the risk factors described under “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the year ended 30 September 2019 with the additional risk factor set forth below, which supplements, and to the extent inconsistent, supersedes such risk factors.

The COVID-19 global pandemic may materially and adversely impact our business, financial condition and results of operations.

The COVID-19 global pandemic and efforts to reduce its spread have led to a significant decline of economic activity and significant disruption and volatility in global markets. These factors have led to reduced demand for industrial gas products, particularly in our merchant business. We expect reduced demand in our merchant business to accelerate, particularly in our Industrial Gases – Americas and Industrial Gases – EMEA segments, and for certain planned maintenance activities to be delayed. In addition, COVID-19 may result in reduced sales in our other businesses, lower returns for certain of our projects, and the potential delay or cancellation of certain projects in our pipeline. In addition, we are monitoring the health of our employees and certain of our employees, including those based at our headquarters, are working remotely in accordance with health safety guidance and applicable governmental orders. Action by health or other governmental authorities requiring the closure of our facilities or recommending other physical distancing could negatively impact our business and those of our service providers and customers. Although we have business continuity and other safeguards in place, we cannot be certain that they will be fully effective for extended periods of time. As the pandemic and responses to it continue to evolve we may experience further adverse impacts on our operations, including increased costs under our existing debt arrangements, and our ability to access capital on favorable terms, or at all, may be impaired. In addition, we may face unpredictable increases in demand for certain of our products when restrictions on business and travel end. If demand for our products exceeds our capacity, it could adversely affect our financial results and customer relationships. Although the duration and ultimate impact of these factors is unknown at this time, the decline in economic conditions due to COVID-19, or another disease-causing similar impacts, may adversely affect our business, financial condition and results of operations and such impact may be material.

To the extent COVID-19 adversely affects our business, financial condition, and results of operations and global economic conditions more generally, it may also have the effect of heightening many of the other risk factors described in “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the year ended 30 September 2019.

Item 6. Exhibits.

(a) Exhibits required by Item 601 of Regulation S-K

Exhibit No.	Description
(10)	Material Contracts
10.1	Form of Restricted Stock Unit Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2020 awards.
10.2	Form of Performance Share Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2020 awards.
(31)	Rule 13a-14(a)/15d-14(a) Certifications
31.1	Certification by the Principal Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification by the Principal Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
(32)	Section 1350 Certifications
32.1	Certification by the Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002. †
(101)	Interactive Data Files
101.INS	Inline XBRL Instance Document. The XBRL Instance Document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	Inline XBRL Taxonomy Extension Schema Document.
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document.
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.
104	Cover Page Interactive Data File, formatted in Inline XBRL (included in Exhibit 101).

† The certification attached as Exhibit 32 that accompanies this Quarterly Report on Form 10-Q is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Air Products and Chemicals, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Form 10-Q, irrespective of any general incorporation language contained in such filing.

SIGNATURE

Pursuant to the requirements 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.

Air Products and Chemicals, Inc.

(Registrant)

Date: 23 April 2020

By:

/s/ M. Scott Crocco

M. Scott Crocco

Executive Vice President and Chief Financial Officer