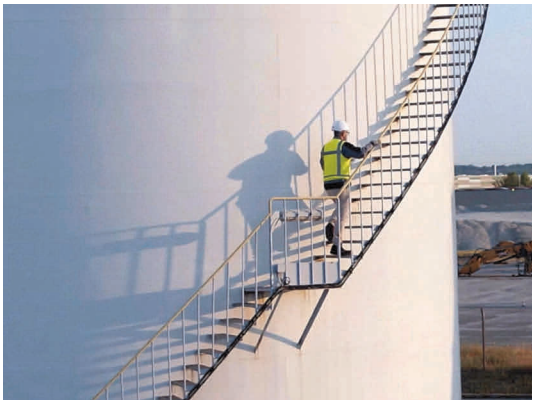
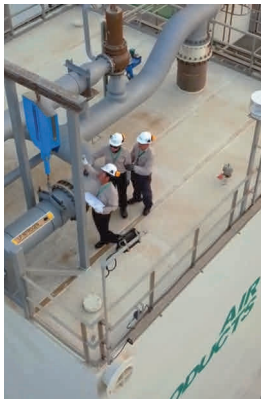
2020

Annual Report





COVID-19

We Stand Together

Images featured on the cover and in this Report were taken prior to mask-wearing and social-distancing protocols related to COVID-19. Proud to be designated as a critical industry, Air Products has put important protocols and procedures in place to help keep our employees, customers and communities safe while continuing to run our facilities around the world, provide the critical products and services that society needs, and win important projects. We Stand Together.

Our Businesses

Air Products reported fiscal year 2020 results under five segments:

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

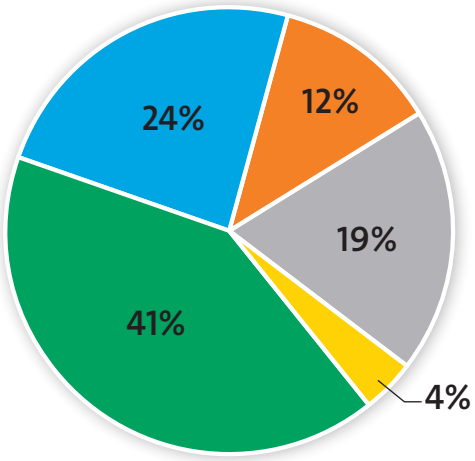
The **regional Industrial Gases** segments (Americas, EMEA, and Asia) produce and sell atmospheric gases, such as oxygen, nitrogen, and argon; process gases, such as hydrogen, helium, carbon dioxide, carbon monoxide, and syngas (a mixture of hydrogen and carbon monoxide); and specialty gases. We serve customers in many industries, including refining, chemical, gasification, metals, electronics, manufacturing, and food and beverage. We distribute gases to customers through a variety of supply modes, including liquid or gaseous bulk supply delivered by tanker or tube trailer and, for smaller customers, packaged gases delivered in cylinders and dewars or small on-sites (cryogenic or non-cryogenic generators). For large-volume customers, we construct an on-site plant adjacent to or near the customer's facility or deliver product from one of our pipelines.

The **Industrial Gases – Global** segment includes activity related to the sale of cryogenic and gas processing equipment for air separation. The equipment is sold worldwide to customers in a variety of industries, including chemical and petrochemical manufacturing, oil and gas recovery and processing, and steel and primary metals processing. The Industrial Gases – Global segment also includes centralized global costs associated with management of all the Industrial Gases segments.

The **Corporate and other** segment includes our liquefied natural gas (LNG), turbo machinery equipment and services, and distribution sale of equipment businesses, as well as corporate support functions that benefit all segments.

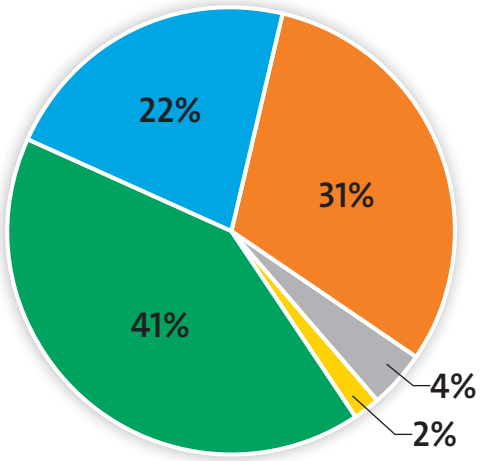
Financial highlights

Consolidated sales by region



- U.S./Canada
- Europe/Middle East/Africa
- Asia (excluding China)
- China
- Latin America

Consolidated sales by business segment



- Industrial Gases – Americas
- Industrial Gases – EMEA
- Industrial Gases – Asia
- Industrial Gases – Global
- Corporate and other

Millions of dollars, except for per share data	**2020**	2019	Change
FOR THE YEAR (all from continuing operations, unless otherwise indicated)			
GAAP			
Sales	**$8,856**	$8,919	(1)%
Net income margin[A]	**21.8%**	20.3%	150 bp
Operating margin	**25.3%**	24.0%	130 bp
Return on capital employed ("ROCE") (GAAP Basis)	**8.9%**	9.4%	(50) bp
Cash used for investing activities	**$3,560**	$2,113	68%
NON-GAAP			
Adjusted EBITDA margin[B]	**40.9%**	38.9%	200 bp
Adjusted operating margin[B]	**24.9%**	24.3%	60 bp
ROCE (Non-GAAP Basis)[B]	**11.7%**	13.1%	(140) bp
Capital expenditures[C]	**$2,717**	$2,129	28%
PER SHARE			
GAAP diluted earnings per share ("EPS")	**$8.55**	$7.94	8%
Adjusted diluted EPS[B]	**8.38**	8.21	2%
Dividends declared per common share	**5.18**	4.58	13%

(A) Fiscal year 2020 includes the impact from discontinued operations.
(B) Amounts are non-GAAP financial measures. See pages III-VII for reconciliation to the comparable GAAP measures.
(C) Amounts are non-GAAP financial measures. See reconciliation to the comparable GAAP measures within Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations*, of the accompanying Annual Report on Form 10-K.

Non-GAAP measures

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

Adjusted EBITDA

We define adjusted EBITDA as net income less income (loss) from discontinued operations, net of tax, and excluding non-GAAP adjustments, which we do 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. Net income margin and adjusted EBITDA margin are calculated by dividing net income and adjusted EBITDA, respectively, by consolidated sales for each period. 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:

2020	Q1	Q2	Q3	Q4	Total
Sales	$2,254.7	$2,216.3	$2,065.2	$2,320.1	$8,856.3
Net income	$488.9	$490.4	$457.1	$494.7	$1,931.1
Net income margin	21.7%	22.1%	22.1%	21.3%	21.8%
Net income	$488.9	$490.4	$457.1	$494.7	$1,931.1
Less: Loss from discontinued operations, net of tax	—	(14.3)	—	—	(14.3)
Add: Interest expense	18.7	19.3	32.1	39.2	109.3
Less: Other non-operating income (expense), net	9.1	7.1	8.1	6.4	30.7
Add: Income tax provision	120.7	148.5	109.3	99.9	478.4
Add: Depreciation and amortization	289.2	294.7	290.6	310.5	1,185.0
Less: Company headquarters relocation income (expense)	—	33.8	—	—	33.8
Less: India Finance Act 2020 – equity affiliate income impact	—	33.8	—	—	33.8
Adjusted EBITDA	$908.4	$892.5	$881.0	$937.9	$3,619.8
Adjusted EBITDA margin	40.3%	40.3%	42.7%	40.4%	40.9%

2019	Q1	Q2	Q3	Q4	Total
Sales	$2,224.0	$2,187.7	$2,224.0	$2,283.2	$8,918.9
Net income	$357.0	$433.5	$500.2	$518.7	$1,809.4
Net income margin	16.0%	19.8%	22.5%	22.7%	20.3%
Net income	$357.0	$433.5	$500.2	$518.7	$1,809.4
Less: Income from discontinued operations, net of tax	–	—	–	—	–
Add: Interest expense	37.3	35.4	34.2	30.1	137.0
Less: Other non-operating income (expense), net	18.5	13.7	17.6	16.9	66.7
Add: Income tax provision	132.1	107.5	109.3	131.2	480.1
Add: Depreciation and amortization	258.0	262.1	269.1	293.6	1,082.8
Add: Facility closure	29.0	—	—	—	29.0
Add: Cost reduction actions	—	—	25.5	—	25.5
Less: Gain on exchange of equity affiliate investments	—	—	29.1	—	29.1
Adjusted EBITDA	$794.9	$824.8	$891.6	$956.7	$3,468.0
Adjusted EBITDA margin	35.7%	37.7%	40.1%	41.9%	38.9%

2018	Q1	Q2	Q3	Q4
Sales	$2,216.6	$2,155.7	$2,259.0	$2,298.9
Net income	$161.7	$423.6	$487.9	$459.7
Net income margin	7.3%	19.7%	21.6%	20.0%
Net income	$161.7	$423.6	$487.9	$459.7
Less: Income (loss) from discontinued operations, net of tax	(1.0)	—	43.2	—
Add: Interest expense	29.8	30.4	34.9	35.4
Less: Other non-operating income (expense), net	9.8	11.1	12.8	(28.6)
Add: Income tax provision	291.8	56.2	107.1	69.2
Add: Depreciation and amortization	227.9	240.0	245.6	257.2
Less: Change in inventory valuation method	—	—	—	24.1
Add: Tax reform repatriation - equity method investment	32.5	—	—	(4.0)
Adjusted EBITDA	$734.9	$739.1	$819.5	$822.0
Adjusted EBITDA margin	33.2%	34.3%	36.3%	35.8%

2017	Q1	Q2	Q3	Q4
Sales	$1,882.5	$1,980.1	$2,121.9	$2,203.1
Net income	$306.4	$2,135.7	$104.1	$475.0
Net income margin	16.3%	107.9%	4.9%	21.6%
Net income	$306.4	$2,135.7	$104.1	$475.0
Less: Income (loss) from discontinued operations, net of tax	48.2	1,825.6	(2.3)	(5.5)
Add: Interest expense	29.5	30.5	29.8	30.8
Less: Other non-operating income (expense), net	(0.2)	5.3	3.7	7.8
Add: Income tax provision (benefit)	78.4	94.5	89.3	(1.3)
Add: Depreciation and amortization	206.1	211.8	216.9	231.0
Add: Business separation costs	32.5	—	—	—
Add: Cost reduction and asset actions	50.0	10.3	42.7	48.4
Add: Goodwill and intangible asset impairment charge	—	—	162.1	—
Less: Gain on land sale	—	—	—	12.2
Add: Equity method investment impairment charge	—	—	79.5	—
Adjusted EBITDA	$654.9	$651.9	$723.0	$769.4
Adjusted EBITDA margin	34.8%	32.9%	34.1%	34.9%

2016	Q1	Q2	Q3	Q4
Sales	$1,866.3	$1,777.4	$1,914.5	$1,945.5
Net income	$372.0	($465.5)	$354.1	$400.9
Net income margin	19.9%	(26.2)%	18.5%	20.6%
Net income	$372.0	($465.5)	$354.1	$400.9
Less: Income (loss) from discontinued operations, net of tax	84.8	(750.2)	98.4	106.5
Add: Interest expense	22.2	25.7	35.1	32.2
Add: Income tax provision	96.4	93.5	145.9	96.8
Add: Depreciation and amortization	214.7	213.9	213.5	212.5
Add: Business separation costs	12.0	7.4	9.5	21.7
Add: Cost reduction and asset actions	—	10.7	13.2	10.6
Add: Pension settlement loss	—	2.0	1.0	2.1
Add: Loss on extinguishment of debt	—	—	–	6.9
Adjusted EBITDA	$632.5	$637.9	$673.9	$677.2
Adjusted EBITDA margin	33.9%	35.9%	35.2%	34.8%

2015	Q1	Q2	Q3	Q4
Sales	$2,041.0	$1,885.3	$1,934.4	$1,963.6
Net income	$337.5	$296.9	$333.2	$350.0
Net income margin	16.5%	15.7%	17.2%	17.8%
Net income	$337.5	$296.9	$333.2	$350.0
Less: Income from discontinued operations, net of tax	76.7	103.4	99.4	72.2
Add: Interest expense	28.8	23.2	28.1	22.7
Add: Income tax provision	76.8	63.0	74.7	85.7
Add: Depreciation and amortization	215.3	213.9	214.2	215.1
Add: Business separation costs	—	—	—	7.5
Add: Business restructuring and cost reduction actions	24.3	52.9	49.6	53.3
Less: Gain on previously held equity interest	17.9	—	—	—
Less: Gain on land sales	—	—	—	33.6
Add: Pension settlement loss	—	11.9	1.4	6.0
Add: Loss on extinguishment of debt	—	—	–	16.6
Adjusted EBITDA	$588.1	$558.4	$601.8	$651.1
Adjusted EBITDA margin	28.8%	29.6%	31.1%	33.2%

2014[(A)]	Q1	Q2	Q3	Q4
Sales	$2,545.5	$2,581.9	$2,634.6	$2,677.0
Net income	$299.0	$291.6	$ 323.4	$79.1
Net income margin	11.7%	11.3%	12.3%	3.0%
Net income	$299.0	$291.6	$323.4	$79.1
Income (loss) from discontinued operations, net of tax	1.3	(2.1)	(2.0)	(0.1)
Add: Interest expense	33.3	31.5	31.3	29.0
Add: Income tax provision	95.3	93.0	103.0	78.1
Add: Depreciation and amortization	234.2	229.1	239.0	254.6
Add: Business restructuring and cost reduction actions	—	—	—	12.7
Add: Goodwill and intangible asset impairment charge	—	—	—	310.1
Add: Pension settlement loss	—	—	—	5.5
Adjusted EBITDA	$660.5	$647.3	$698.7	$769.2
Adjusted EBITDA margin	25.9%	25.1%	26.5%	28.7%

(A) Fiscal year 2014 is presented as previously reported in our Annual Report on Form 10-K for the year ended September 30, 2016, which included the results of the former Materials Technologies segment.

Adjusted Operating Margin

Below is a reconciliation of adjusted operating margin to operating margin on a GAAP basis. Operating margin and adjusted operating margin are calculated by dividing operating income and adjusted operating income, respectively, by consolidated sales for each period. The adjusted measures exclude the impact of certain disclosed items that we believe are not representative of underlying business performance.

Year Ended 30 September	**2020**	2019	Change
Sales	**$8,856.3**	$8,918.9	
Operating income	**2,237.6**	2,144.4	
Operating margin	**25.3%**	24.0%	130 bp
Operating income	**$2,237.6**	$2,144.4	
Facility closure	**—**	29.0	
Cost reduction actions	**—**	25.5	
Gain on exchange of equity affiliate investments	**—**	(29.1)	
Company headquarters relocation (income) expense	**(33.8)**	—	
Adjusted operating income	**$2,203.8**	$2,169.8	
Adjusted operating margin	**24.9%**	24.3%	60 bp

Adjusted Diluted Earnings Per Share ("EPS")

Adjusted diluted EPS is calculated as net income from continuing operations attributable to Air Products, excluding the impact of certain disclosed items that we believe are not representative of underlying business performance, divided by the weighted average common shares that reflects the potential dilution that could occur if stock options or other share-based awards were exercised or converted into common stock. 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.

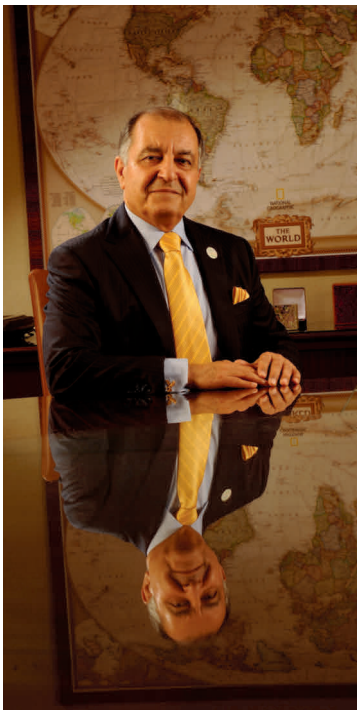
Year Ended 30 September	**2020**	2019	2018	2017	2016	2015	2014
Diluted EPS	**$8.55**	$7.94	$6.59	$5.16	$5.04	$4.29	$3.24
Change in inventory valuation method	**—**	—	(0.08)	—	—	—	—
Facility closure	**—**	0.10	—	—	—	—	—
Business separation costs	**—**	—	—	0.12	0.21	0.03	—
Tax (benefit) costs associated with business separation	**—**	—	—	(0.02)	0.24	—	—
Business restructuring, cost reduction, and asset actions	**—**	0.08	—	0.49	0.11	0.61	0.03
Goodwill and intangible asset impairment charge	**—**	—	—	0.70	—	—	1.27
Gain on exchange of equity affiliate investments	**—**	(0.13)	—	—	—	—	—
Gain on previously held equity interest	**—**	—	—	—	—	(0.05)	—
Company headquarters relocation (income) expense	**(0.12)**	—	—	—	—	—	—
Gain on land sales	**—**	—	—	(0.03)	—	(0.13)	—
India Finance Act 2020	**(0.06)**	—	—	—	—	—	—
Equity method investment impairment charge	**—**	—	—	0.36	—	—	—
Pension settlement loss	**—**	0.02	0.15	0.03	0.02	0.06	0.02
Loss on extinguishment of debt	**—**	—	—	—	0.02	0.07	—
Tax reform repatriation	**—**	(0.06)	2.16	—	—	—	—
Tax reform adjustment related to deemed foreign dividends	**—**	0.26	(0.25)	—	—	—	—
Tax reform rate change and other	**—**	—	(0.96)	—	—	—	—
Tax restructuring	**—**	—	(0.16)	—	—	—	—
Tax election benefit	**—**	—	—	(0.50)	—	—	(0.14)
Adjusted Diluted EPS	**$8.38**	$8.21	$7.45	$6.31	$5.64	$4.88	$4.42
Change GAAP							
Diluted EPS $ change	**$0.61**	$1.35	$1.43	$0.12	$ 0.75	$1.05	
Diluted EPS % change	**8%**	20%	28%	2%	17%	32%	
Change Non-GAAP							
Adjusted diluted EPS $ change	**$0.17**	$0.76	$1.14	$0.67	$0.76	$0.46	
Adjusted diluted EPS % change	**2%**	10%	18%	12%	16%	10%	

Return on Capital Employed ("ROCE") (Non-GAAP Basis)

Return on capital employed ("ROCE") is calculated on a continuing operations basis. Management considers this measure to be useful in evaluating the Company's returns on capital.

	2020				2019				2018
ROCE (GAAP Basis)	Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1	Q4
Net income	$494.7	$457.1	$490.4	$488.9	$518.7	$500.2	$433.5	$357.0	
Total liabilities and equity	25,168.5	24,782.1	19,501.2	19,651.6	18,942.8	19,531.9	19,244.5	19,142.0	19,178.3
Four-Quarter Trailing Net Income	$1,931.1				$1,809.4				
Five-Quarter Average Total Liabilities and Equity	21,609.2				19,207.9				
ROCE (GAAP Basis)	8.9%				9.4%				
ROCE (GAAP Basis) change	(50) bp								
ROCE (Non-GAAP Basis)									
Net income	$494.7	$457.1	$490.4	$488.9	$518.7	$500.2	$433.5	$357.0	
Loss from discontinued operations, net of tax	—	—	14.3	—	—	—	—	—	
Interest expense	39.2	32.1	19.3	18.7	30.1	34.2	35.4	37.3	
Facility closure	—	—	—	—	—	—	—	29.0	
Cost reduction actions	—	—	—	—	—	25.5	—	—	
Gain on exchange of equity affiliate investments	—	—	—	—	—	(29.1)	—	—	
Company headquarters relocation (income) expense	—	—	(33.8)	—	—	—	—	—	
India Finance Act 2020	—	—	(33.8)	—	—	—	—	—	
Pension settlement loss	—	—	—	—	—	—	5.0	—	
Tax reform repatriation	—	—	—	—	—	3.2	—	(15.6)	
Tax reform adjustment related to deemed foreign dividends	—	—	—	—	—	—	—	56.2	
Tax other[(A)]	(6.6)	(6.2)	24.1	(3.7)	(6.1)	(12.8)	(8.2)	(17.0)	
Return After-Tax (Non-GAAP Basis)	$527.3	$483.0	$480.5	$503.9	$542.7	$521.2	$465.7	$446.9	
Total Capital									
Total liabilities and equity	$25,168.5	$24,782.1	$19,501.2	$19,651.6	$18,942.8	$19,531.9	$19,244.5	$19,142.0	$19,178.3
Less: Payables and accrued liabilities	1,833.2	1,668.5	1,649.1	1,630.0	1,635.7	1,543.2	1,513.7	1,738.3	1,817.8
Less: Accrued income taxes	105.8	83.6	90.4	113.4	86.6	65.6	70.7	111.9	59.6
Less: Other noncurrent liabilities	1,916.0	1,866.9	1,881.0	1,826.7	1,712.4	1,553.6	1,560.5	1,551.6	1,536.9
Less: Deferred income taxes	962.6	942.0	844.4	810.5	793.8	823.2	805.4	768.9	775.1
Capital Employed (Non-GAAP Basis)	$20,350.9	$20,221.1	$15,036.3	$15,271.0	$14,714.3	$15,546.3	$15,294.2	$14,971.3	$14,988.9
Four-Quarter Trailing Return After-Tax—Non-GAAP	$1,994.7				$1,976.5				
Five-Quarter Average Capital Employed—Non-GAAP	17,118.7				15,103.0				
ROCE (Non-GAAP Basis)	11.7%				13.1%				
ROCE (Non-GAAP Basis) change	(140) bp								

(A) Represents the tax impact on interest expense and our pre-tax non-GAAP adjustments.



Seifi Ghasemi
Chairman, President and Chief Executive Officer of Air Products

To our shareholders

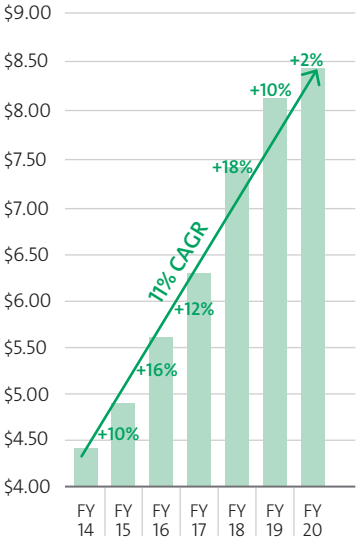
My fellow shareholders:

Over the past six years, we have transformed Air Products into the best performing industrial gas company in the world. By executing our strategic Five-Point Plan, we are creating sustainable growth opportunities that deliver value to our shareholders, customers, employees and communities around the world.

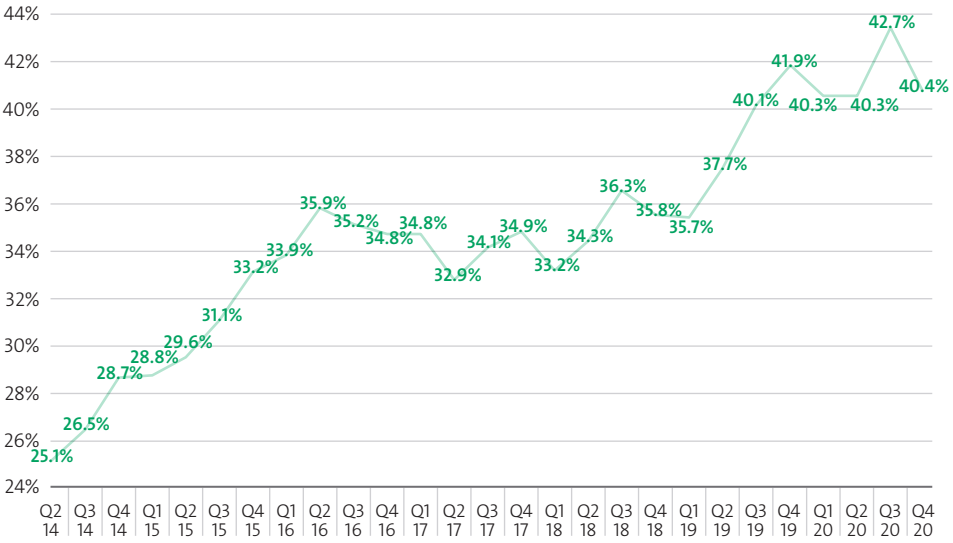
In 2020, the world faced unprecedented challenges due to the COVID-19 pandemic. I am very proud of the dedicated team of more than 19,000 employees at Air Products who kept our 750+ plants running, supplied our customers with essential products, executed significant projects and improved our profitability, all under very challenging conditions.

Despite the challenges, we delivered strong financial results, as you can see below. Our on-site business—which represents about half of our sales—continued to deliver stable cash flow. Our business model supports and enables our strong financial position. We continued to execute on our gasification, carbon capture and hydrogen for mobility growth strategy, and we successfully raised about $5 billion of debt to ensure we are ready for even more profitable growth opportunities. Meanwhile, we returned about $1.1 billion to our shareholders through our dividend, which we increased for the 38th consecutive year.

Adjusted earnings per share trend*



Adjusted EBITDA margin trend*
Up over 1,500 basis points



* Amounts are non-GAAP financial measures. See reconciliation to GAAP results on pages III-VII.

Fiscal 2020 Performance

Our fiscal 2020 financial performance is detailed in the accompanying Annual Report on Form 10-K, and I would encourage you to also see the investor slides on our website, which highlight our achievements and plans for the future.

One specific area I want to highlight is safety, which is always our highest priority. Although our safety record improved in fiscal 2020, with a 63 percent improvement in the employee lost-time injury rate and 31 percent improvement in the employee recordable injury rate since fiscal 2014, we did not achieve our ultimate goal: zero incidents and accidents.

Safety is a moral responsibility, and our people know that the challenges of COVID-19 cannot distract us from that ultimate goal.

Making Our Dream a Reality

I do not like to focus on past performance, because I like the **dreams of the future** more than the history of the past.

Our **dream of the future** is to make sure Air Products will continue to be the safest, most diverse and most profitable industrial gas company in the world, providing excellent service to our customers.

Our **dream of the future** is for Air Products to become the largest American chemical company as measured by market capitalization.

Our **dream of the future** is for Air Products to be the leader in providing solutions to the world's environmental challenges through:

- Gasification of coal, petcoke, and refinery residues;
- Developing solutions to capture CO_2 from gasifiers and hydrogen plants; and
- Further developing technologies and making Air Products the leader in providing hydrogen for transportation around the world.

Our **dream of the future** is to be a company that has a higher purpose beyond just creating value for shareholders through improved financial performance . . .

. . . a company where people from all walks of life and nationalities come together, work together, and feel that they belong and that their contributions matter and are appreciated . . .

. . . a company that is focused on innovation to solve the substantial environmental issues facing all humanity . . .

. . . a company that is compassionate and contributes to the well-being of all the communities in which we operate around the globe . . .

. . . a global company that brings people from all over the world together, to collaborate, improve understanding and prevent conflicts that arise from misunderstanding.

I am proud to say that we have continued to create and win projects that help customers and countries meet their growing needs for cleaner energy and environmental solutions. In doing so, we are **making our dream a reality**.

Making Our Dream a Reality in Fiscal 2020

$7 billion NEOM project | Announced the NEOM project, which will enable Air Products to supply carbon-free hydrogen to power buses and trucks by 2025 and eliminate three million tons-per-year of CO_2 emissions and smog-forming emissions and other pollutants from the equivalent of more than 700,000 cars.

$2 billion Indonesia project | Signed a long-term on-site contract for a world-scale coal-to-methanol production facility in Indonesia, supporting energy independence and enabling the production of nearly two million tons-per-year of methanol.

Largest-ever U.S. investment (Texas) | Announced our largest-ever U.S. investment for the Gulf Coast Ammonia project in Texas.

Acquisition of 5 operating U.S. hydrogen plants | Completed the acquisition of five operating U.S. hydrogen plants and supplied hydrogen to PBF Energy in California and Delaware.

Multiple on-site projects for electronics customers | Completed multiple on-site projects for electronics manufacturers in China and Malaysia.

Construction of 3 nitrogen plants (The Netherlands) | Began construction of three nitrogen plants to condition imported natural gas for Gasunie supporting a national energy project in Groningen, Netherlands.

Steam methane reformer and cold box (Louisiana) | Brought onstream a steam methane reformer and cold box to supply products to our U.S. Gulf Coast pipeline in Louisiana.

LNG **World-leading LNG process technology** | Selected to supply our world-leading LNG process technology and equipment for Mozambique's first onshore LNG project; Qatargas' massive LNG production expansion project in Ras Laffan, State of Qatar; and Sonatrach's GL1Z LNG facility in Arzew, Algeria.

Higher Purpose

We obviously are committed to delivering superior financial performance, but our people also know they are supporting a higher purpose in the work they do every day. Our higher purpose at Air Products is to bring people around the world together, so that they can, in an open environment, collaborate and innovate solutions to some of the most significant energy and environmental challenges we all face.

As we deploy these sustainable solutions alongside our customers, we also continue to make commitments to further improve our own sustainability performance. We announced our "Third by '30" carbon intensity reduction goal, focused on reducing carbon dioxide emissions relative to the amount of energy that we are delivering to the world. The goal is fully aligned with our business strategy, is near-term and measurable, and holds us accountable for delivering.

We also announced new goals to further drive diversity and build our culture where people feel they belong and matter. We will aim to achieve at least 28 percent female representation globally, and at least 20 percent minority representation in the U.S. in our professional and managerial population by 2025. Our growth projects give us a unique opportunity to bring diverse talent into our company. As we measure our progress, we will continually stretch and drive for further improvement.

Our Higher Purpose:

Bringing people together to collaborate and innovate solutions to the world's most significant energy and environmental sustainability challenges.

Acknowledgments

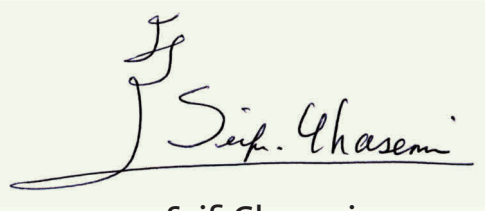
As I do each year, in closing, I want to sincerely thank those who have supported us and helped us achieve our success.

To our customers . . . In innovating alongside you, we serve our higher purpose – supplying products that benefit the environment and help you be more efficient and sustainable. Thank you for your continued confidence and trust in us.

To our employees . . . Through your dedication and commitment, you continue to play a critical role and make a difference to the world every day, and especially during these challenging times.

To our shareholders . . . As always, thank you for your confidence and trust in Air Products. Our priority remains creating superior value for you.

Despite significant uncertainty in the global economy and ongoing challenges from COVID-19, we continue to deliver value through our stable business model, financial position, exciting growth opportunities, and most importantly, our continuing commitment and dedication to **stand together** and **work together** to make a **difference for our world**.



Seifi Ghasemi
Chairman, President and
Chief Executive Officer of Air Products

Board of Directors

Susan K. Carter
Retired Senior Vice President and Chief Financial Officer of Ingersoll-Rand Plc.
Director of the Company since 2011.

Charles I. Cogut
Retired Partner, Simpson Thacher & Bartlett LLP.
Director of the Company since 2015.

Lisa A. Davis
Former Member of the Managing Board of Siemens AG and Former Chair and CEO of Siemens Corporation USA.
Director of the Company since 2020.

Chadwick C. (Chad) Deaton
Retired Chairman and Chief Executive Officer of Baker Hughes Incorporated.
Director of the Company since 2010.

Seifi Ghasemi
Chairman, President and Chief Executive Officer of the Company.
Director of the Company since 2013.

David H. Y. Ho
Chairman and Founder of Kiina Investment Ltd.
Director of the Company since 2013.

Edward L. Monser
(Lead Director)
Retired President and Chief Operating Officer of Emerson Electric Co.
Director of the Company since 2013.

Matthew H. Paull
Retired Senior Executive Vice President and Chief Financial Officer of McDonald's Corporation.
Director of the Company since 2013.

Executive Officers

Seifi Ghasemi
Chairman, President and Chief Executive Officer

M. Scott Crocco
Executive Vice President and Chief Financial Officer

Sean D. Major
Executive Vice President, General Counsel and Secretary

Dr. Samir J. Serhan
Executive Vice President and Chief Operating Officer

For more information about corporate governance practices at Air Products, visit our Governance website at www.airproducts.com/company/governance.

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

FORM 10-K

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

For the fiscal year ended 30 September 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) (Zip Code)
610-481-4911
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $1.00 per share	APD	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
0.500% Euro Notes due 2028	APD28	New York Stock Exchange
0.800% Euro Notes due 2032	APD32	New York Stock Exchange

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.	Yes ☒	No ☐
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.	Yes ☐	No ☒
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.	Yes ☒	No ☐
Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).	Yes ☒	No ☐

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

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.	☐
Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C.7262(b)) by the registered public accounting firm that prepared or issued its audit report.	☒
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).	Yes ☐ No ☒

The aggregate market value of the voting stock held by non-affiliates of the registrant on 31 March 2020 was approximately $44.0 billion. For purposes of the foregoing calculations, all directors and/or executive officers have been deemed to be affiliates, but the registrant disclaims that any such director and/or executive officer is an affiliate.

The number of shares of common stock outstanding as of 31 October 2020 was 221,026,592.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021 are incorporated by reference into Part III.

AIR PRODUCTS AND CHEMICALS, INC.
ANNUAL REPORT ON FORM 10-K
For the fiscal year ended 30 September 2020

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FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K 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,” "future," “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;
- our ability 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, public health crises, 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;

FORWARD-LOOKING STATEMENTS (CONTINUED)

- significant fluctuations in interest rates and foreign currency exchange rates from those currently anticipated;
- 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 1A, *Risk Factors*, Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations*, and Item 7A, *Quantitative and Qualitative Disclosures About Market Risk*. 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

Item 1. Business.

Air Products and Chemicals, Inc., a Delaware corporation originally founded in 1940, serves customers globally with a unique portfolio of products, services, and solutions that include atmospheric gases, process and specialty gases, equipment, and services. We are the world's largest supplier of hydrogen and have built leading positions in growth markets such as helium and liquefied natural gas ("LNG") process technology and equipment. We also develop, engineer, build, own and operate some of the world's largest industrial gas projects, including gasification projects that sustainably convert abundant natural resources into syngas for the production of high-value power, fuels and chemicals, carbon capture projects, and world-scale carbon-free hydrogen projects supporting global transportation and the energy transition.

As used in this report, unless the context indicates otherwise, the terms "we," "our," "us," the "Company," "Air Products," or "registrant" include controlled subsidiaries, affiliates, and predecessors of Air Products and our controlled subsidiaries and affiliates.

During the fiscal year ended 30 September 2020 ("fiscal year 2020"), we reported our continuing operations in five reporting segments under which we managed our operations, assessed performance, and reported earnings: Industrial Gases – Americas; Industrial Gases – EMEA (Europe, Middle East, and Africa); Industrial Gases – Asia; Industrial Gases – Global; and Corporate and other.

Except as otherwise noted, the description of our business below reflects our continuing operations. Refer to Note 6, *Discontinued Operations*, to the consolidated financial statements for activity associated with discontinued operations.

Industrial Gases Business

Our Industrial Gases business produces atmospheric gases, such as oxygen, nitrogen, and argon, process gases, such as hydrogen, helium, carbon dioxide (CO_2), carbon monoxide, and syngas, and specialty gases. Atmospheric gases are produced through various air separation processes of which cryogenic is the most prevalent. Process gases are produced by methods other than air separation. For example, hydrogen, carbon monoxide and syngas are produced by steam methane reforming of natural gas and by the gasification of liquid and solid hydrocarbons. Hydrogen is produced by purifying byproduct sources obtained from the chemical and petrochemical industries; and helium is produced as a byproduct of gases extracted from underground reservoirs, primarily natural gas, but also CO_2 purified before resale. The Industrial Gases business also develops, builds and operates equipment for the production or processing of gases, such as air separation units and non-cryogenic generators.

Our Industrial Gases business is organized and operated regionally. The regional Industrial Gases segments (Americas, EMEA, and Asia) supply gases and related equipment in the relevant region to diversified customers in many industries, including those in refining, chemical, gasification, metals, electronics, manufacturing, and food and beverage. Hydrogen is used by refiners to facilitate the conversion of heavy crude feedstock and lower the sulfur content of gasoline and diesel fuels as well as in the developing mobility markets. The chemicals industry uses hydrogen, oxygen, nitrogen, carbon monoxide, and syngas as feedstocks in the production of many basic chemicals. The energy production industry uses nitrogen injection for enhanced recovery of oil and natural gas and oxygen for gasification. Oxygen is used in combustion and industrial heating applications, including in the gasification, steel, certain nonferrous metals, glass, and cement industries. Nitrogen applications are used in food processing for freezing and preserving flavor and nitrogen for inerting is used in various fields, including the metals, chemical, and semiconductor industries. Helium is used in laboratories and healthcare for cooling and in other industries for pressurizing, purging, and lifting. Argon is used in the metals and other industries for its unique inerting, thermal conductivity, and other properties. Industrial gases are also used in welding and providing healthcare and are utilized in various manufacturing processes to make them more efficient and to optimize performance.

Industrial gases are generally produced at or near the point of use given the complexity and inefficiency with storing molecules at low temperatures. Helium, however, is generally sourced globally, at long distances from point of sale. As a result, we maintain an inventory of helium stored in our fleet of ISO containers as well as the U.S. Bureau of Land Management underground storage facility in Amarillo, Texas.

We distribute gases to our sale of gas customers through different supply modes depending on various factors including the customer's volume requirements and location. Our supply modes are as follows:

- *Liquid Bulk*—Product is delivered in bulk (in liquid or gaseous form) by tanker or tube trailer and stored, usually in its liquid state, in equipment that we typically design and install at the customer's site for vaporizing into a gaseous state as needed. Liquid bulk sales are usually governed by three- to five-year contracts.
- *Packaged Gases*—Small quantities of product are delivered in either cylinders or dewars. We operate packaged gas businesses in Europe, Asia, and Latin America. In the United States, our packaged gas business sells products (principally helium) only for the electronics and magnetic resonance imaging industries.
- *On-Site Gases*—Large quantities of hydrogen, nitrogen, oxygen, carbon monoxide, and syngas (a mixture of hydrogen and carbon monoxide) are provided to customers, principally in the energy production and refining, chemical, gasification, and metals industries worldwide, that require large volumes of gases and have relatively constant demand. Gases are produced at large facilities located adjacent to customers' facilities or by pipeline systems from centrally located production facilities and are generally governed by 15- to 20- year contracts. We also deliver small quantities of product through small on-site plants (cryogenic or non-cryogenic generators), typically either via a 10- to 15- year sale of gas contract or through the sale of the equipment to the customer.

Electricity is the largest cost component in the production of atmospheric gases. Steam methane reformers utilize natural gas as the primary raw material and gasifiers use liquid and solid hydrocarbons as the principal raw material for the production of hydrogen, carbon monoxide and syngas. We mitigate electricity, natural gas, and hydrocarbon price fluctuations contractually through pricing formulas, surcharges, and cost pass-through and tolling arrangements. During fiscal year 2020, no significant difficulties were encountered in obtaining adequate supplies of power and natural gas.

We obtain helium from a number of sources globally, including crude helium for purification from the U.S. Bureau of Land Management's helium reserve.

The regional Industrial Gases segments also include our share of the results of several joint ventures accounted for by the equity method, which are reported in our financial statements as income from equity affiliates. The largest of these joint ventures operate in China, India, Italy, Mexico, Saudi Arabia, South Africa, and Thailand.

Each of the regional Industrial Gases segments competes against three global industrial gas companies: Air Liquide S.A., Messer and Linde plc (the successor to Praxair, Inc. and Linde AG, pursuant to a combination that became effective on 31 October 2018), as well as regional competitors. Competition in Industrial Gases is based primarily on price, reliability of supply, and the development of industrial gas applications. We derive a competitive advantage in locations where we have pipeline networks, which enable us to provide reliable and economic supply of products to our larger customers.

Overall regional industrial gases sales constituted approximately 94%, 96%, and 94% of consolidated sales in fiscal years 2020, 2019, and 2018, respectively. Sales of atmospheric gases constituted approximately 47%, 46%, and 46% of consolidated sales in fiscal years 2020, 2019, and 2018, respectively, while sales of tonnage hydrogen, syngas, and related products constituted approximately 22%, 26%, and 25% of consolidated sales in fiscal years 2020, 2019, and 2018, respectively.

Industrial Gases Equipment

We design and manufacture equipment for air separation, hydrocarbon recovery and purification, natural gas liquefaction, and liquid helium and liquid hydrogen transport and storage. The Industrial Gases – Global segment includes activity related to the sale of cryogenic and gas processing equipment for air separation. The equipment is sold worldwide to customers in a variety of industries, including chemical and petrochemical manufacturing, oil and gas recovery and processing, and steel and primary metals processing. The Corporate and other segment includes three global equipment businesses: our LNG equipment business, our Gardner Cryogenics business fabricating helium and hydrogen transport and storage containers, and our Rotoflow business, which manufactures turboexpanders and other precision rotating equipment. Steel, aluminum, and capital equipment subcomponents (compressors, etc.) are the principal raw materials in the manufacturing of equipment. Raw materials for individual projects typically are acquired under firm purchase agreements. Equipment is produced at our manufacturing sites with certain components being procured from subcontractors and vendors. Competition in the equipment business is based primarily on technological performance, service, technical know-how, price, and performance guarantees. Sale of equipment constituted approximately 6%, 4%, and 6% of consolidated sales in fiscal years 2020, 2019, and 2018, respectively.

The backlog of equipment orders was approximately $1.6 billion on 30 September 2020 (as compared to a total backlog of approximately $0.9 billion on 30 September 2019). We estimate that approximately 50% of the total equipment sales backlog as of 30 September 2020 will be recognized as revenue during fiscal year 2021, dependent on execution schedules of the relevant projects.

International Operations

Through our subsidiaries, affiliates, and joint ventures accounted for using the equity method, we conduct business in 53 countries outside the United States. Our international businesses are subject to risks customarily encountered in foreign operations, including fluctuations in foreign currency exchange rates and controls, tariffs, trade sanctions, and import and export controls, and other economic, political, and regulatory policies of local governments described in Item 1A, Risk Factors, below.

We have majority or wholly owned foreign subsidiaries that operate in Canada; 18 European countries (including the Netherlands, Spain, and the United Kingdom); 11 Asian countries (including China, South Korea, and Taiwan); seven Latin American countries (including Brazil and Chile); six countries in the Middle East (including Saudi Arabia), and three African countries. We also own less-than-controlling interests in entities operating in Europe, Asia, Latin America, the Middle East, and Africa (including China, Germany, India, Italy, Mexico, Oman, Saudi Arabia, South Africa, and Thailand).

Financial information about our foreign operations and investments is included in Note 8, *Summarized Financial Information of Equity Affiliates*; Note 22, *Income Taxes*; and Note 25, *Business Segment and Geographic Information*, to the consolidated financial statements included under Item 8, below. Information about foreign currency translation is included under “Foreign Currency” in Note 1, *Major Accounting Policies*, and information on our exposure to currency fluctuations is included in Note 13, *Financial Instruments*, to the consolidated financial statements, included under Item 8, below, and in “Foreign Currency Exchange Rate Risk,” included under Item 7A, below.

Technology Development

We pursue a market-oriented approach to technology development through research and development, engineering, and commercial development processes. It conducts research and development principally in its laboratories located in the United States (Trexlertown, Pennsylvania), the United Kingdom (Basingstoke and Carrington), Spain (Barcelona), China (Shanghai), and Saudi Arabia (Dhahran). We also fund and cooperate in research and development programs conducted by a number of major universities and undertake research work funded by others, including the United States government.

Development of technology for use within the Industrial Gases business focuses primarily on new and improved processes and equipment for the production and delivery of industrial gases and new or improved applications for industrial gas products.

During fiscal year 2020, we owned approximately 850 United States patents, approximately 3,600 foreign patents, and were a licensee under certain patents owned by others. While the patents and licenses are considered important, we do not consider our business as a whole to be materially dependent upon any particular patent, patent license, or group of patents or licenses.

Environmental Regulation

We are subject to various environmental laws and regulations in the countries in which we have operations. Compliance with these laws and regulations results in higher capital expenditures and costs. 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. Our accounting policy for environmental expenditures is discussed in Note 1, *Major Accounting Policies*, and environmental loss contingencies are discussed in Note 17, *Commitments and Contingencies*, to the consolidated financial statements, included under Item 8, below.

Some of our operations are within jurisdictions that have or are developing regulatory regimes governing emissions of greenhouse gases (“GHG”), including CO_2. These include existing coverage under the European Union Emission Trading System, the California cap and trade scheme, China’s Emission Trading Scheme and its nation-wide expansion, and South Korea’s Emission Trading Scheme. In the Netherlands, a CO_2 emissions tax will come into force on 1 January 2021. In Canada, Alberta’s Technology Innovation and Emission Reduction (“TIER”) System went into effect 1 January 2020. In Ontario, Environment & Climate Change Canada’s ("ECCC”) Output Based Pricing System (“OBPS”) is currently in effect, however, on 20 September 2020, ECCC granted approval of Ontario’s GHG Emissions Performance Standards program, which will be used in lieu of adherence to the OBPS, with the effective date to be determined. In addition, the U.S. Environmental Protection Agency (“EPA”) requires mandatory reporting of GHG emissions and is regulating GHG emissions for new construction and major modifications to existing facilities. Some jurisdictions have various mechanisms to target the power sector to achieve emission reductions, which often result in higher power costs.

Increased public concern may result in more international, U.S. federal, and/or regional requirements to reduce or mitigate the effects of GHG emissions. Although uncertain, these developments could increase our costs related to consumption of electric power, hydrogen production and application of our gasification technology. We believe we will be able to mitigate some of the increased costs through contractual terms, but the lack of definitive legislation or regulatory requirements prevents an accurate estimate of the long-term impact these measures will have on our operations. Any legislation that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products.

Regulation of GHG may also produce new opportunities for us. We continue to develop technologies to help our facilities and our customers lower energy consumption, improve efficiency and lower emissions. We see significant opportunities for gasification, carbon capture technologies and hydrogen for mobility and energy transition.

We estimate that we spent approximately $4 million, $5 million, and $3 million in fiscal years 2020, 2019, and 2018, respectively, on capital projects reflected in continuing operations to control pollution. Capital expenditures to control pollution are estimated to be approximately $6 million in both fiscal years 2021 and 2022.

For additional information regarding environmental matters, refer to Item 7, “*Management’s Discussion and Analysis of Financial Condition and Results of Operations – Environmental Matters*” and Note 17, *Commitments and Contingencies*, to the consolidated financial statements.

Employees

We believe our employees are our most valuable asset and are critical to our success as an organization. Our goal is to be the safest, most diverse and most profitable industrial gas company in the world, providing excellent service to our customers. Integral to our success is the continued development of our 4S culture (Safety, Speed, Simplicity and Self-Confidence) and creating a work environment where all employees feel that they belong and matter. Our talent related initiatives, including employee recruitment and development, diversity and inclusion and compensation and benefit programs, are focused on building and retaining the world-class and talented staff that is needed to meet our goals.

On 30 September 2020 we had approximately 19,275 employees, of whom approximately 19,000 were full-time and of whom approximately 14,150 were located outside the United States. We have collective bargaining agreements with unions at certain locations that expire on various dates over the next four years. We consider relations with our employees to be good.

We value the contributions of our employees, particularly in the face of the challenges posed by the COVID-19 pandemic. Many of our employees are on the front line during the pandemic, keeping our plants running and delivering to our customers the products they need. When possible, employees have been working from home to help maintain their health and safety as well as business continuity. We have not laid off any of our employees or reduced their salaries due to COVID-19.

In October 2020, we announced goals to further increase the percentage of women and U.S. minorities in professional and managerial roles. By 2025, we aim to achieve at least 28 percent female representation in the professional and managerial population globally, and at least 20 percent minority representation in that same population in the United States. These measures are increases from 25 and 17 percent representation (2020 baseline), respectively. We established these new targets following analysis of our global employee representation metrics and future talent needs, as well as assessing industry benchmarks and peer companies.

Seasonality

Our businesses are not subject to seasonal fluctuations to any material extent.

Inventories

We maintain limited inventory where required to facilitate the supply of products to customers on a reasonable delivery schedule. Inventory consists primarily of crude helium, industrial gas, and specialty gas inventories supplied to customers through liquid bulk and packaged gases supply modes.

Customers

We do not have a homogeneous customer base or end market, and no single customer accounts for more than 10% of our consolidated revenues. We do have concentrations of customers in specific industries, primarily refining, chemicals, and electronics. Within each of these industries, we have several large-volume customers with long-term contracts. A negative trend affecting one of these industries, or the loss of one of these major customers, although not material to our consolidated revenue, could have an adverse impact on our financial results.

Governmental Contracts

Our business is not subject to a government entity’s renegotiation of profits or termination of contracts that would be material to our business as a whole.

Available Information

All periodic and current reports, registration statements, proxy statements, and other filings that we are required to file with the Securities and Exchange Commission ("SEC"), including our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) of the Securities Exchange Act of 1934 (the "Exchange Act"), are available free of charge through our website at www.airproducts.com. Such documents are available as soon as reasonably practicable after electronic filing of the material with the SEC. All such reports filed during the period covered by this report were available on our website on the same day as filing. In addition, our filings with the SEC are available free of charge on the SEC's website, www.sec.gov.

Our Executive Officers

Our executive officers and their respective positions and ages on 19 November 2020 follow. Information with respect to offices held is stated in fiscal years.

Name	Age	Office
M. Scott Crocco	56	Executive Vice President and Chief Financial Officer (became Executive Vice President and Chief Financial Officer in 2016; Senior Vice President and Chief Financial Officer in 2013; and Vice President and Corporate Controller in 2008).
Seifi Ghasemi	76	Chairman, President, and Chief Executive Officer (became Chairman, President and Chief Executive Officer in 2014 and previously served as Chairman and Chief Executive Officer of Rockwood Holdings, Inc. from 2001 to 2014). Mr. Ghasemi is a member and Chairman of the Board of Directors and the Chairman of the Executive Committee of the Board of Directors.
Sean D. Major	56	Executive Vice President, General Counsel and Secretary (Executive Vice President and General Counsel since May 2017 and Secretary since December 2017). Previously, Mr. Major served as Executive Vice President, General Counsel and Secretary for Joy Global Inc. from 2007 to 2017.
Dr. Samir J. Serhan	59	Executive Vice President and Chief Operating Officer (Executive Vice President since December 2016 and Chief Operating Officer since May 2020). Dr. Serhan served as President, Global HyCO, from 2014 to 2016 for Praxair Inc. From 2000-2014, he worked in leadership positions in the U.S. and Germany for The Linde Group, including as Managing Director of Linde Engineering from 2008-2014.

Item 1A. Risk Factors.

Our operations are affected by various risks, many of which are beyond our control. In evaluating investment in the Company and the forward-looking information contained in this Annual Report on Form 10-K or presented elsewhere by management from time to time, you should carefully consider the risk factors discussed below. Any of these risks could have a material adverse effect on our business, operating results, financial condition, and the actual outcome of matters as to which forward-looking statements are made and could adversely affect the value of an investment in our securities. In addition to the following risks, there may be additional risks and uncertainties that adversely affect our business, performance, or financial condition in the future that are not presently known, are not currently believed to be significant, or are not identified below because they are common to all businesses.

Risks Related to Economic Conditions

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 demand to continue to be impacted as well as the timing of certain planned maintenance activities. 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 many 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 measures 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 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.

Further, 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 risks described herein.

Changes in global and regional economic conditions, the markets we serve, or the financial markets may adversely affect our results of operations and cash flows.

Unfavorable conditions in the global economy or regional economies, the markets we serve or financial markets may decrease the demand for our goods and services and adversely impact our revenues, operating results, and cash flows.

Demand for our products and services depends in part on the general economic conditions affecting the countries and markets in which we do business. Weak economic conditions in certain geographies and changing supply and demand balances in the markets we serve have negatively impacted demand for our products and services in the past, including most recently due to COVID-19, and may do so in the future. Reduced demand for our products and services would have a negative impact on our revenues and earnings. In addition, reduced demand could depress sales, reduce our margins, constrain our operating flexibility or reduce efficient utilization of our manufacturing capacity, or result in charges which are unusual or nonrecurring. Excess capacity in our manufacturing facilities or those of our competitors could decrease our ability to maintain pricing and generate profits.

In addition, our operating results in one or more segments may be affected by uncertain or deteriorating economic conditions for particular customer markets within a segment. A decline in the industries served by our customers or adverse events or circumstances affecting individual customers can reduce demand for our products and services, and impair the ability of such customers to satisfy their obligations to us, resulting in uncollected receivables, unanticipated contract terminations, project delays or the inability to recover plant investments, any of which may negatively impact our financial results.

Weak overall demand or specific customer conditions may also cause customer shutdowns or defaults or other inabilities to operate facilities profitably and may force sale or abandonment of facilities and equipment or prevent projects from coming on-stream when expected. These or other events associated with weak economic conditions or specific market, product, or customer events may require us to record an impairment on tangible assets, such as facilities and equipment, or intangible assets, such as intellectual property or goodwill, which would have a negative impact on our financial results.

Our extensive international operations can be adversely impacted by operational, economic, political, security, legal, and currency translation risks that could decrease profitability.

In fiscal year 2020, over 60% of our sales were derived from customers outside the United States and many of our operations, suppliers, and employees are located outside the United States. Our operations in foreign jurisdictions may be subject to risks including exchange control regulations, import and trade restrictions, trade policy and other potentially detrimental domestic and foreign governmental practices or policies affecting U.S. companies doing business abroad. Changing economic and political conditions within foreign jurisdictions, strained relations between countries, or the imposition of tariffs or international sanctions can cause fluctuations in demand, price volatility, supply disruptions, or loss of property. The occurrence of any of these risks could have a material adverse impact on our financial condition, results of operation, and cash flows.

Our growth strategies depend in part on our ability to further penetrate markets outside the United States, particularly in markets such as China, India, Indonesia, and the Middle East, and involve significantly larger and more complex projects, including gasification projects, some in regions where there is the potential for significant economic and political disruptions. We are actively investing large amounts of capital and other resources, in some cases through joint ventures, in developing markets, which we believe to have high growth potential. Our operations in these markets may be subject to greater risks than those faced by our operations in mature economies, including political and economic instability, project delay or abandonment due to unanticipated government actions, inadequate investment in infrastructure, undeveloped property rights and legal systems, unfamiliar regulatory environments, relationships with local partners, language and cultural differences and increased difficulty recruiting, training and retaining qualified employees. In addition, our properties and contracts in these locations may be subject to seizure and cancellation, respectively, without full compensation for loss. Successful operation of particular facilities or execution of projects may be disrupted by civil unrest, acts of war, sabotage or terrorism, and other local security concerns. Such concerns may require us to incur greater costs for security or require us to shut down operations for a period of time.

Furthermore, because the majority of our revenue is generated from sales outside the United States, we are exposed to fluctuations in foreign currency exchange rates. Our business is primarily exposed to translational currency risk as the results of our foreign operations are translated into U.S. dollars at current exchange rates throughout the fiscal period. Our policy is to minimize cash flow volatility from changes in currency exchange rates. We choose not to hedge the translation of our foreign subsidiaries' earnings into dollars. Accordingly, reported sales, net earnings, cash flows, and fair values have been, and in the future will be, affected by changes in foreign exchange rates. For a more detailed discussion of currency exposure, see Item 7A, *Quantitative and Qualitative Disclosures About Market Risk*, below.

Risks Related to Our Business

Operational and project execution risks, particularly with respect to our largest projects, may adversely affect our operations or financial results.

A significant and growing portion of our business involves gasification and other large-scale projects that involve challenging engineering, procurement and construction phases that may last up to several years. These projects are technically complex, often reliant on significant interaction with government authorities and face significant financing, development, operational and reputational risks. We may encounter difficulties in engineering, delays in designs or materials provided by the customer or a third party, equipment and materials delivery delays, schedule changes, customer scope changes, delays related to obtaining regulatory permits and rights-of-way, inability to find adequate sources of labor in the locations where we are building new plants, weather-related delays, delays by customers' contractors in completing their portion of a project, technical or transportation difficulties, cost overruns, supply difficulties, geopolitical risks and other factors, many of which are beyond our control, that may impact our ability to complete a project within the original delivery schedule. In some cases, delays and additional costs may be substantial, and we may be required to cancel a project and/or compensate the customer for the delay. We may not be able to recover any of these costs. In addition, in some cases we seek financing for large projects and face market risk associated with the availability and terms of such financing. These financing arrangements may require that we comply with certain performance requirements which, if not met, could result in default and restructuring costs or other losses. All of these factors could also negatively impact our reputation or relationships with our customers, suppliers and other third parties, any of which could adversely affect our ability to secure new projects in the future.

The operation of our facilities, pipelines, and delivery systems inherently entails hazards that require continuous oversight and control, such as pipeline leaks and ruptures, fire, explosions, toxic releases, mechanical failures, or vehicle accidents. If operational risks materialize, they could result in loss of life, damage to the environment, or loss of production, all of which could negatively impact our ongoing operations, reputation, financial results, and cash flows. In addition, our operating results are dependent on the continued operation of our production facilities and our ability to meet customer requirements, which depend, in part, on our ability to properly maintain and replace aging assets.

We are subject to extensive government regulation in the jurisdictions in which we do business. Regulations addressing, among other things, import/export restrictions, anti-bribery and corruption, and taxes, can negatively impact our financial condition, results of operation, and cash flows.

We are subject to government regulation in the United States and in the foreign jurisdictions where we conduct business. The application of laws and regulations to our business is sometimes unclear. Compliance with laws and regulations may involve significant costs or require changes in business practices that could result in reduced profitability. If there is a determination that we have failed to comply with applicable laws or regulations, we may be subject to penalties or sanctions that could adversely impact our reputation and financial results. Compliance with changes in laws or regulations can result in increased operating costs and require additional, unplanned capital expenditures. Export controls or other regulatory restrictions could prevent us from shipping our products to and from some markets or increase the cost of doing so. Changes in tax laws and regulations and international tax treaties could affect the financial results of our businesses. Increasingly aggressive enforcement of anti-bribery and anti-corruption requirements, including the U.S. Foreign Corrupt Practices Act, the United Kingdom Bribery Act and the China Anti-Unfair Competition Law, could subject us to criminal or civil sanctions if a violation is deemed to have occurred. In addition, we are subject to laws and sanctions imposed by the U.S. and other jurisdictions where we do business that may prohibit us, or certain of our affiliates, from doing business in certain countries, or restricting the kind of business that we may conduct. Such restrictions may provide a competitive advantage to competitors who are not subject to comparable restrictions or prevent us from taking advantage of growth opportunities.

Further, we cannot guarantee that our internal controls and compliance systems will always protect us from acts committed by employees, agents, business partners or that businesses that we acquire would not violate U.S. and/or non-U.S. laws, including the laws governing payments to government officials, bribery, fraud, kickbacks and false claims, pricing, sales and marketing practices, conflicts of interest, competition, export and import compliance, money laundering, and data privacy. Any such improper actions or allegations of such acts could damage our reputation and subject us to civil or criminal investigations in the U.S. and in other jurisdictions and related shareholder lawsuits, could lead to substantial civil and criminal, monetary and non-monetary penalties, and could cause us to incur significant legal and investigatory fees. In addition, the government may seek to hold us liable as a successor for violations committed by companies in which we invest or that we acquire.

We may be unable to successfully identify, execute or effectively integrate acquisitions, or effectively disentangle divested businesses.

Our ability to grow revenue, earnings, and cash flow at anticipated rates depends in part on our ability to identify, successfully acquire and integrate businesses and assets at appropriate prices, and realize expected growth, synergies, and operating efficiencies. We may not be able to complete transactions on favorable terms, on a timely basis or at all. In addition, our results of operations and cash flows may be adversely impacted by the failure of acquired businesses or assets to meet expected returns, the failure to integrate acquired businesses, the inability to dispose of non-core assets and businesses on satisfactory terms and conditions, and the discovery of unanticipated liabilities or other problems in acquired businesses or assets for which we lack adequate contractual protections or insurance. In addition, we may incur asset impairment charges related to acquisitions that do not meet expectations.

We continually assess the strategic fit of our existing businesses and may divest businesses that are deemed not to fit with our strategic plan or are not achieving the desired return on investment. These transactions pose risks and challenges that could negatively impact our business and financial statements. For example, when we decide to sell or otherwise dispose of a business or assets, we may be unable to do so on satisfactory terms within our anticipated time frame or at all. In addition, divestitures or other dispositions may dilute our earnings per share, have other adverse financial and accounting impacts, distract management, and give rise to disputes with buyers. In addition, we have agreed, and may in the future agree, to indemnify buyers against known and unknown contingent liabilities. Our financial results could be impacted adversely by claims under these indemnification provisions.

The security of our information technology systems could be compromised, which could adversely affect our ability to operate.

We depend on information technology to enable us to operate efficiently and interface with customers as well as to maintain our internal controls environment and financial reporting accuracy and efficiency. Our information technology capabilities are delivered through a combination of internal and external services and service providers. If we do not allocate and effectively manage the resources necessary to build and sustain the proper technology infrastructure, we could be subject to transaction errors, processing inefficiencies, the loss of customers, business disruptions, or the loss of or damage to our confidential business information due to a security breach. In addition, our information technology systems may be damaged, disrupted or shut down due to attacks by computer hackers, computer viruses, employee error or malfeasance, power outages, hardware failures, telecommunication or utility failures, catastrophes or other unforeseen events, and in any such circumstances our system redundancy and other disaster recovery planning may be ineffective or inadequate. Security breaches of our systems (or the systems of our customers, suppliers or other business partners) could result in the misappropriation, destruction or unauthorized disclosure of confidential information or personal data belonging to us or to our employees, partners, customers or suppliers, and may subject us to legal liability.

As with most large systems, our information technology systems have in the past been, and in the future likely will be subject to computer viruses, malicious codes, unauthorized access and other cyber-attacks, and we expect the sophistication and frequency of such attacks to continue to increase. To date, we are not aware of any significant impact on our operations or financial results from such attempts; however, unauthorized access could disrupt our business operations, result in the loss of assets, and have a material adverse effect on our business, financial condition, or results of operations. Any of the attacks, breaches or other disruptions or damage described above could: interrupt our operations at one or more sites; delay production and shipments; result in the theft of our and our customers' intellectual property and trade secrets; damage customer and business partner relationships and our reputation; result in defective products or services, legal claims and proceedings, liability and penalties under privacy laws, or increased costs for security and remediation; or raise concerns regarding our internal controls environment and internal controls over financial reporting. Each of these consequences could adversely affect our business, reputation and our financial statements.

Our business involves the use, storage, and transmission of information about our employees, vendors, and customers. The protection of such information, as well as our proprietary information, is critical to us. The regulatory environment surrounding information security and privacy is increasingly demanding, with the frequent imposition of new and constantly changing requirements. We have established policies and procedures to help protect the security and privacy of this information. We also, from time to time, export sensitive customer data and technical information to recipients outside the United States. Breaches of our security measures or the accidental loss, inadvertent disclosure, or unapproved dissemination of proprietary information or sensitive or confidential data about us or our customers, including the potential loss or disclosure of such information or data as a result of fraud, trickery, or other forms of deception, could expose us, our customers, or the individuals affected to a risk of loss or misuse of this information, which could ultimately result in litigation and potential legal and financial liability. These events could also damage our reputation or otherwise harm our business.

Interruption in ordinary sources of raw material or energy supply or an inability to recover increases in energy and raw material costs from customers could result in lost sales or reduced profitability.

Hydrocarbons, including natural gas, are the primary feedstock for the production of hydrogen, carbon monoxide, and syngas. Energy, including electricity, natural gas, and diesel fuel for delivery trucks, is the largest cost component of our business. Because our industrial gas facilities use substantial amounts of electricity, energy price fluctuations could materially impact our revenues and earnings. A disruption in the supply of energy, components, or raw materials, whether due to market conditions, legislative or regulatory actions, natural events, or other disruption, could prevent us from meeting our contractual commitments and harm our business and financial results.

Our supply of crude helium for purification and resale is largely dependent upon natural gas production by crude helium suppliers. Lower natural gas production resulting from natural gas pricing dynamics, supplier operating or transportation issues or other interruptions in sales from crude helium suppliers, can reduce our supplies of crude helium available for processing and resale to customers.

We typically contract to pass-through cost increases in energy and raw materials to customers, but cost variability can still have a negative impact on our results. We may be unable to raise prices as quickly as costs rise, or competitive pressures may prevent full recovery of such costs. Increases in energy or raw material costs that cannot be passed on to customers for competitive or other reasons may negatively impact our revenues and earnings. Even where costs are passed through, price increases can cause lower sales volume.

New technologies create performance risks that could impact our financial results or reputation.

We are continually developing and implementing new technologies and product offerings. Existing technologies are being implemented in products and designs or at scales beyond our experience base. These technological expansions can create nontraditional performance risks to our operations. Failure of the technologies to work as predicted, or unintended consequences of new designs or uses, could lead to cost overruns, project delays, financial penalties, or damage to our reputation. In addition, large scale gasification projects may contain processes or technologies that we have not operated at the same scale or in the same combination, and although such projects generally include technologies and processes that have been demonstrated previously by others, such technologies or processes may be new to us and may introduce new risks to our operations. Additionally, there is also a risk that our new technologies may become obsolete and replaced by other market alternatives. Performance difficulties on these larger projects may have a material adverse effect on our operations and financial results. In addition, performance challenges may adversely affect our reputation and our ability to obtain future contracts for gasification projects.

Protecting our intellectual property is critical to our technological development and we may suffer competitive harm from infringement on such rights.

As we develop new technologies, it is critical that we protect our intellectual property assets against third-party infringement. We own a number of patents and other forms of intellectual property related to our products and services. As we develop new technologies there is a risk that our patent applications may not be granted, or we may not receive sufficient protection of our proprietary interests. We may also expend considerable resources in defending our patents against third-party infringement. It is critical that we protect our proprietary interests to prevent competitive harm.

Legal and Regulatory Risks

Legislative, regulatory and societal responses to global climate change create financial risk.

We are the world's leading supplier of hydrogen, the primary use of which is the production of ultra-low sulfur transportation fuels that have significantly reduced transportation emissions and helped improve human health. To make the high volumes of hydrogen needed by our customers, we use steam methane reforming, which releases carbon dioxide. In addition, although gasification enables the conversion of lower value feedstocks into cleaner energy and value-added products, our gasification projects will increase our carbon footprint because the gasification process produces carbon dioxide. Some of our operations are within jurisdictions that have or are developing regulatory regimes governing GHG emissions, including CO_2, which may lead to direct and indirect costs on our operations. Furthermore, some jurisdictions have various mechanisms to target the power sector to achieve emission reductions, which often result in higher power costs.

Increased public concern and governmental action may result in more international, U.S. federal and/or regional requirements to reduce or mitigate the effects of GHG emissions. Although uncertain, these developments could increase our costs related to consumption of electric power, hydrogen production and application of our gasification technology. We believe we will be able to mitigate some of the increased costs through contractual terms, but the lack of definitive legislation or regulatory requirements prevents an accurate estimate of the long-term impact these measures will have on our operations. Any legislation or governmental action that limits or taxes GHG emissions could negatively impact our growth, increase our operating costs, or reduce demand for certain of our products.

Our financial results may be affected by various legal and regulatory proceedings, including antitrust, tax, environmental, or other matters.

We are subject to litigation and regulatory investigations and proceedings in the normal course of business and could become subject to additional claims in the future, some of which could be material. While we seek to limit our liability in our commercial contractual arrangements, there are no guarantees that each contract will contain suitable limitations of liability or that limitations of liability will be enforceable. Also, the outcome of existing legal proceedings may differ from our expectations because the outcomes of litigation, including regulatory matters, are often difficult to predict reliably. Various factors or developments can lead us to change current estimates of liabilities and related insurance receivables, where applicable, or make such estimates for matters previously not susceptible to reasonable estimates, such as a significant judicial ruling or judgment, a significant settlement, significant regulatory developments, or changes in applicable law. A future adverse ruling, settlement, or unfavorable development could result in charges that could have a material adverse effect on our financial condition, results of operations, and cash flows in any particular period.

Costs and expenses resulting from compliance with environmental regulations may negatively impact our operations and financial results.

We are subject to extensive federal, state, local, and foreign environmental and safety laws and regulations concerning, among other things, emissions in the air; discharges to land and water; and the generation, handling, treatment, and disposal of hazardous waste and other materials. We take our environmental responsibilities very seriously, but there is a risk of adverse environmental impact inherent in our manufacturing operations and in the transportation of our products. Future developments and more stringent environmental regulations may require us to make additional unforeseen environmental expenditures. In addition, laws and regulations may require significant expenditures for environmental protection equipment, compliance, and remediation. These additional costs may adversely affect our financial results. For a more detailed description of these matters, see Item 1, *Business–Environmental Regulation*, above.

A change of tax law in key jurisdictions could result in a material increase in our tax expense.

The multinational nature of our business subjects us to taxation in the United States and numerous foreign jurisdictions. Due to economic and political conditions, tax rates in various jurisdictions may be subject to significant change. Our future effective tax rates could be affected by changes in the mix of earnings in countries with differing statutory tax rates, changes in the valuation of deferred tax assets and liabilities, or changes in tax laws or their interpretation.

Changes to income tax laws and regulations in any of the jurisdictions in which we operate, or in the interpretation of such laws, could significantly increase our effective tax rate and adversely impact our financial condition, results of operations or cash flows. In December 2017, the U.S. enacted the Tax Cuts and Jobs Act (the "Tax Act"), which significantly revised the U.S. federal corporate income tax law by, among other things, lowering the corporate income tax rate, implementing a territorial tax system, and imposing a one-time tax on accumulated, unremitted non-U.S. earnings of foreign subsidiaries. Various levels of government are increasingly focused on tax reform and other legislative action to increase tax revenue. Further changes in tax laws in the U.S. or foreign jurisdictions where we operate could have a material adverse effect on our business, results of operations, or financial condition.

We could incur significant liability if the distribution of Versum common stock to our stockholders is determined to be a taxable transaction.

We have received an opinion from outside tax counsel to the effect that the spin-off of Versum qualifies as a transaction that is described in Sections 355(a) and 368(a)(1)(D) of the Internal Revenue Code. The opinion relies on certain facts, assumptions, representations and undertakings from Versum and us regarding the past and future conduct of the companies' respective businesses and other matters. If any of these facts, assumptions, representations or undertakings are incorrect or not satisfied, our shareholders and we may not be able to rely on the opinion of tax counsel and could be subject to significant tax liabilities. Notwithstanding the opinion of tax counsel we have received, the IRS could determine on audit that the spin-off is taxable if it determines that any of these facts, assumptions, representations or undertakings are not correct or have been violated or if it disagrees with the conclusions in the opinion. If the spin-off is determined to be taxable for U.S. federal income tax purposes, our shareholders that are subject to U.S. federal income tax and we could incur significant U.S. federal income tax liabilities.

General Risk Factors

Catastrophic events could disrupt our operations or the operations of our suppliers or customers, having a negative impact on our business, financial results, and cash flows.

Our operations could be impacted by catastrophic events outside our control, including severe weather conditions such as hurricanes, floods, earthquakes, storms, epidemics, pandemics, acts of war and terrorism. Any such event could cause a serious business disruption that could affect our ability to produce and distribute products and possibly expose us to third-party liability claims. Additionally, such events could impact our suppliers, customers and partners, which could cause energy and raw materials to be unavailable to us, or our customers to be unable to purchase or accept our products and services. Any such occurrence could have a negative impact on our operations and financial results.

The United Kingdom's ("UK") exit from European Union ("EU") membership could adversely affect our European Operations.

The UK's exit from EU membership may adversely affect customer demand, our relationships with customers and suppliers and our European business. Although it is unknown what the terms of the United Kingdom's future relationship with the EU will be, it is possible that there will be greater restrictions on imports and exports between the United Kingdom and EU members and increased regulatory complexities. Any of these factors could adversely affect customer demand, our relationships with customers and suppliers, and our European business overall.

Inability to compete effectively in a segment could adversely impact sales and financial performance.

We face strong competition from large global competitors and many smaller regional competitors in many of our business segments. Introduction by competitors of new technologies, competing products, or additional capacity could weaken demand for, or impact pricing of our products, negatively impacting financial results. In addition, competitors' pricing policies could affect our profitability or market share.

Item 1B. Unresolved Staff Comments.

We have not received any written comments from the Commission staff that remain unresolved.

Item 2. Properties.

Air Products and Chemicals, Inc. owns its principal administrative offices, which are the Company's headquarters located in Trexlertown, Pennsylvania; Hersham, England; Medellin, Colombia; and Santiago, Chile. We lease the principal administrative offices in Shanghai, China; Pune, India; Vadodara, India; and Dhahran, Saudi Arabia. We lease administrative offices in the United States, Canada, Spain, Malaysia, and China for our Global Business Support organization. In addition, we are currently constructing new administrative offices and a co-located research and development facility in Trexlertown, Pennsylvania in preparation for re-location of our principal offices to the nearby site.

Descriptions of the properties used by our five business segments are provided below. We believe that our facilities are suitable and adequate for our current and anticipated future levels of operation.

Industrial Gases – Americas

This business segment currently operates from over 425 production and distribution facilities in North and South America. Approximately 25% of these facilities are located on owned property and 10% are integrated sites that serve dedicated customers as well as merchant customers. We have sufficient property rights and permits for the ongoing operation of our pipeline systems in the Gulf Coast, California, and Arizona in the United States and Alberta and Ontario, Canada. Management and sales support is based in our Trexlertown, Medellin, and Santiago offices referred to above, and at 12 leased properties located throughout North and South America.

We built hydrogen fueling stations that support commercial markets in California and Japan as well as demonstration projects in Europe and other parts of Asia.

Industrial Gases – EMEA

This business segment currently operates from over 200 production and distribution facilities in Europe, the Middle East, India, and Africa, approximately one-third of which are on owned property. We have sufficient property rights and permits for the ongoing operation of our pipeline systems in the Netherlands, the United Kingdom, Belgium, France, and Germany. Management and sales support for this business segment is based in Hersham, England, referred to above; Barcelona, Spain; and at 16 leased regional office sites and 15 leased local office sites, located throughout the region.

Industrial Gases – Asia

This business segment currently operates from over 211 production and distribution facilities within Asia, approximately 25% of which are on owned property or long-duration term grants. We have sufficient property rights and permits for the ongoing operation of our pipeline systems in China, South Korea, Taiwan, Malaysia, Singapore, and Indonesia. Management and sales support for this business segment is based in Shanghai, China, and Kuala Lumpur, Malaysia, and in 30 leased office locations throughout the region.

Industrial Gases – Global

Management, sales, and engineering support for this business segment is based in our principal administrative offices noted above.

Equipment is manufactured in Missouri in the United States and Shanghai, China.

Research and development activities for this business segment are conducted at owned locations in the United States, the United Kingdom, and Spain, and three leased locations in Europe and Asia.

Helium is processed at multiple sites in the United States and then distributed to and from transfill sites globally.

Corporate and other

Corporate administrative functions are based in our administrative offices referred to above.

The LNG business operates a manufacturing facility in Florida in the United States with management, engineering, and sales support based in the Trexlertown offices referred to above.

The Gardner Cryogenic business operates at facilities in Pennsylvania and Kansas in the United States.

The Rotoflow business operates manufacturing and service facilities in Texas and Pennsylvania in the United States with management, engineering, and sales support based in the Trexlertown offices referred to above and a nearby leased office.

Item 3. Legal Proceedings.

In the normal course of business, we and our subsidiaries are involved in various legal proceedings, including commercial, competition, environmental, intellectual property, regulatory, product liability, and insurance matters. Although litigation with respect to these matters is routine and incidental to the conduct of our business, such litigation could result in large monetary awards, especially if compensatory and/or punitive damages are awarded. However, we believe that litigation currently pending to which we are a party will be resolved without any material adverse effect on our financial position, earnings, or cash flows.

From time to time, we are also involved in proceedings, investigations, and audits involving governmental authorities in connection with environmental, health, safety, competition, and tax matters.

We are a party to proceedings under CERCLA, 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 is otherwise engaged in investigation or remediation, including cleanup activity at certain of its current and former manufacturing sites. We do not expect that any sums we may have to pay in connection with these environmental matters would have a material adverse impact on our consolidated financial position. Additional information on our environmental exposure is included under *Item 1, Business–Environmental Regulation,* and Note 17, *Commitments and Contingencies*, to the consolidated financial statements.

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 $32 million at 30 September 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 to 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.

Other than the CADE matter discussed above, 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. However, a future charge for regulatory fines or damage awards could have a significant impact on our net income in the period in which it is recorded.

Additional information on our legal proceedings can be found in Note 17, *Commitments and Contingencies*, to the consolidated financial statements.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Our common stock is listed on the New York Stock Exchange under the symbol "APD." As of 31 October 2020, there were 4,957 record holders of our common stock.

Cash dividends on our common stock are paid quarterly. It is our expectation that we will continue to pay cash dividends in the future at comparable or increased levels. The Board of Directors determines whether to declare dividends and the timing and amount based on financial condition and other factors it deems relevant. Dividend information for each quarter of fiscal years 2020 and 2019 is summarized below:

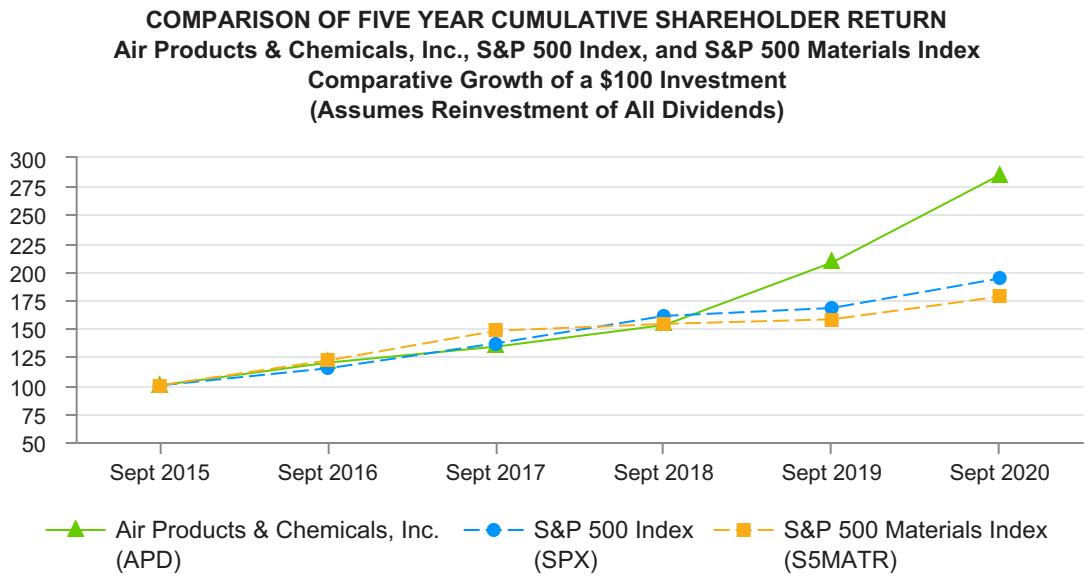
	2020	2019
Fourth quarter	**$1.34**	$1.16
Third quarter	**$1.34**	$1.16
Second quarter	**$1.34**	$1.16
First quarter	**$1.16**	$1.10
Total	**$5.18**	$4.58

Purchases of Equity Securities by the Issuer

On 15 September 2011, the Board of Directors authorized the repurchase of up to $1.0 billion of our outstanding common stock. This program does not have a stated expiration date. We repurchase shares pursuant to Rules 10b5-1 and 10b-18 under the Exchange Act through repurchase agreements established with one or more brokers. There were no purchases of stock during fiscal year 2020. At 30 September 2020, $485.3 million in share repurchase authorization remained. Additional purchases will be completed at our discretion while maintaining sufficient funds for investing in businesses and growth opportunities.

Performance Graph

The performance graph below compares the five-year cumulative returns of our common stock with those of the Standard & Poor's 500 Index ("S&P 500 Index") and the Standard & Poor's 500 Materials Index ("S&P 500 Materials Index"). The figures assume an initial investment of $100 and the reinvestment of all dividends.



	Sept 2015	Sept 2016	Sept 2017	Sept 2018	Sept 2019	Sept 2020
Air Products & Chemicals, Inc.	100	120	134	153	208	285
S&P 500 Index	100	115	137	161	168	194
S&P 500 Materials Index	100	122	148	154	158	178

Item 6. Selected Financial Data.

(Millions of dollars, except for share and per share data)	**2020**	2019	2018	2017	2016
Sales	**$8,856**	$8,919	$8,930	$8,188	$7,504
Operating income	**2,238**	2,144	1,966	1,440	1,535
Operating margin	**25.3 %**	24.0 %	22.0 %	17.6 %	20.5 %
Equity affiliates' income[(A)]	**265**	215	175	80	147
Net income[(B)]	**1,931**	1,809	1,533	3,021	662
Net income margin	**21.8 %**	20.3 %	17.2 %	36.9 %	8.8 %
Income from continuing operations	**1,945**	1,809	1,491	1,155	1,122
Basic earnings per common share from continuing operations	**8.59**	7.99	6.64	5.20	5.08
Diluted earnings per common share from continuing operations	**8.55**	7.94	6.59	5.16	5.04
Adjusted diluted earnings per common share from continuing operations[(C)]	**$8.38**	$8.21	$7.45	$6.31	$5.64
Adjusted EBITDA[(C)]	**3,620**	3,468	3,116	2,799	2,622
Adjusted EBITDA margin[(C)]	**40.9 %**	38.9 %	34.9 %	34.2 %	34.9 %
Dividends declared per common share	**5.18**	4.58	4.25	3.71	3.39
Total assets[(D)]	**25,169**	18,943	19,178	18,467	18,029
Total debt[(E)]	**7,908**	3,326	3,813	3,963	5,211

(A) Fiscal year 2020 included a benefit of $34 related to legislation passed by the Indian government in the second quarter. Fiscal year 2018 included an expense of $29 related to the U.S. Tax Cuts and Jobs Act. Fiscal year 2017 included the impact of an other-than-temporary noncash impairment charge of $80 on a 25%-owned equity affiliate in Saudi Arabia.

(B) Fiscal year 2017 included net income from discontinued operations of $1,866 primarily resulting from the sale of the Performance Materials Division to Evonik Industries AG. Fiscal year 2016 included a net loss from discontinued operations of $465, which included an after-tax loss of $847 related to the exit of Energy-from-Waste, partially offset by income from operations of the former Electronic Materials and Performance Materials divisions.

(C) A reconciliation of adjusted diluted earnings per common share from continuing operations to diluted earnings per common share from continuing operations on a GAAP basis is presented on page 32. A reconciliation of adjusted EBITDA and adjusted EBITDA margin to net income and net income margin on a GAAP basis, respectively, is presented on page 33.

(D) Total assets as of 30 September 2020 was impacted by proceeds from the issuance of U.S. Dollar- and Euro-denominated fixed-rate notes in the third quarter of fiscal year 2020. Total assets as of 30 September 2017 and 2016 included those associated with continuing and discontinued operations.

(E) Total debt includes long-term debt and current portion of long-term debt, including debt owed to related parties, and short-term borrowings as of the end of the fiscal year for continuing operations. Long-term obligations increased in fiscal year 2020 due to the issuance of U.S. Dollar- and Euro-denominated fixed-rate notes in the third quarter. Long-term obligations decreased in fiscal year 2017 primarily due to debt repayments subsequent to the spin-off of the former Electronic Materials Division as Versum Materials, Inc.

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

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This Management's Discussion and Analysis contains "forward-looking statements" within the safe harbor provisions of the Private Securities Litigation Reform Act of 1995, including statements about business outlook. These forward-looking statements are based on management's expectations and assumptions as of the date of this Annual Report and are not guarantees of future performance. Actual performance and financial results may differ materially from projections and estimates expressed in the forward-looking statements because of many factors not anticipated by management, including, without limitation, those described in *Forward-Looking Statements* and Item 1A, *Risk Factors*, of this Annual Report on Form 10-K.

The discussion that follows includes a comparison of our results of operations and liquidity and capital resources for fiscal years 2020 and 2019. For the discussion of changes from fiscal year 2018 to fiscal year 2019 and other financial information related to fiscal year 2018, refer to Part II, Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations*, of our Form 10-K for the fiscal year ended 30 September 2019. This document was filed with the SEC on 26 November 2019.

The following discussion should be read in conjunction with the consolidated financial statements and the accompanying notes contained in this Annual Report. Unless otherwise stated, financial information is presented in millions of dollars, except for per share data. Except for net income, which includes the results of 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 beginning on page 31.

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. In response to COVID-19, we implemented certain health and safety policies to help keep our employees, contractors, customers, and communities safe while continuing to run our facilities, which generally have been considered "essential" by local governments and public health authorities. In compliance with government protocols, our non-essential employees were instructed to work from home until government mandated restrictions allow for a return to the workplace. Those working and visiting our sites are required to follow appropriate procedures, including completion of trainings and performance of self- and on-site screenings, as well as adhere to our personal protective equipment, social distancing, and personal hygiene protocols.

BUSINESS OVERVIEW

Air Products and Chemicals, Inc. is a world-leading industrial gases company that has been in operation for 80 years. Focused on serving energy, environment and emerging markets, we provide essential industrial gases, related equipment and applications expertise to customers in dozens of industries, including refining, chemical, metals, electronics, manufacturing, and food and beverage. Air Products is also the global leader in the supply of liquefied natural gas ("LNG") process technology and equipment. We develop, engineer, build, own and operate some of the world's largest industrial gas projects, including gasification projects that sustainably convert abundant natural resources into syngas for the production of high-value power, fuels and chemicals.

With operations in 50 countries, in fiscal year 2020 we had sales of $8.9 billion and assets of $25.2 billion. Approximately 19,275 passionate, talented and committed full- and part-time employees from diverse backgrounds are driven by Air Products' higher purpose to create innovative solutions that benefit the environment, enhance sustainability and address the challenges facing customers, communities, and the world.

As of 30 September 2020, our operations were organized into five reportable business segments:

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

This Management's Discussion and Analysis discusses our results based on these operations. Refer to Note 25, *Business Segment and Geographic Information*, to the consolidated financial statements for additional details on our reportable business segments.

2020 IN SUMMARY

In fiscal year 2020, our number one priority was the safety and well-being of our people. Since the beginning of the COVID-19 pandemic, we have kept our global plants running, supplied critical products, and supported our local communities during this time of need. We continued to win significant new growth projects around the world and serve our customers, delivering stable results despite the significant health crisis facing the world. We also remained focused on sustainability and our commitment to advancing diversity and inclusion. We set new goals that are aligned with Air Products' business strategy and higher purpose to create innovative solutions that benefit the environment, enhance sustainability, and address the challenges facing customers, communities, and the world.

Fiscal year 2020 results and highlights are summarized below:

- Sales of $8,856.3 decreased 1%, or $62.6, as 3% higher pricing and 2% favorable volumes were more than offset by 4% lower energy and natural gas cost pass-through to customers, 1% unfavorable currency, and the 1% impact of a contract modification to a tolling arrangement in India. We estimate that COVID-19 negatively impacted our overall sales by approximately 4%, primarily driven by lower volumes in our merchant business in the regional industrial gas segments.
- Operating income of $2,237.6 increased 4%, or $93.2, and operating margin of 25.3% increased 130 bp.
- Net income of $1,931.1 increased 7%, or $121.7, and net income margin of 21.8% increased 150 bp.
- Adjusted EBITDA of $3,619.8 increased 4%, or $151.8, and adjusted EBITDA margin of 40.9% increased 200 bp.
- Diluted EPS of $8.55 increased 8%, or $0.61, and adjusted diluted EPS of $8.38 increased 2%, or $0.17. We estimate that COVID-19 negatively impacted our fiscal year 2020 EPS by approximately $0.60-$0.65 per share. A summary table of changes in diluted EPS is presented below.

Fiscal year 2020 results and highlights (continued):

- We increased our quarterly dividend by over 15% from $1.16 to $1.34 per share, representing the largest dividend increase in our 80-year history. This is the 38th consecutive year that we have increased our quarterly dividend payment.
- We successfully executed a debt offering of approximately $5 billion during the third quarter, supporting significant opportunities to invest in high-return industrial gas projects and the repayment of upcoming debt maturities. The issuance included both U.S. Dollar- and Euro-denominated fixed-rate notes.

Changes in Diluted EPS Attributable to Air Products

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.

Year Ended 30 September	**2020**	2019	Increase (Decrease)
Diluted EPS			
Total Diluted EPS	**$8.49**	$7.94	$0.55
Less: Diluted EPS from loss from discontinued operations	**(0.06)**	—	(0.06)
Diluted EPS From Continuing Operations	**$8.55**	$7.94	$0.61
Operating Impacts			
Underlying business			
Volume			($0.19)
Price, net of variable costs			0.77
Other costs			(0.38)
Currency			(0.07)
Facility closure			0.10
Company headquarters relocation income (expense)			0.12
Cost reduction actions			0.08
Gain on exchange of equity affiliate investments			(0.13)
Total Operating Impacts			$0.30
Other Impacts			
Equity affiliates' income			$0.06
Interest expense			0.10
Other non-operating income (expense), net			(0.13)
Change in effective tax rate, excluding discrete items below			0.04
India Finance Act 2020			0.06
Tax reform repatriation			(0.06)
Tax reform adjustment related to deemed foreign dividends			0.26
Noncontrolling interests			0.02
Weighted average diluted shares			(0.03)
Total Other Impacts			$0.32
Total Change in Diluted EPS From Continuing Operations[(A)]			$0.61

[(A)] Includes an estimated negative impact of $0.60-$0.65 from COVID-19. This estimate includes impacts on our sales, costs, and equity affiliates' income.

Year Ended 30 September	2020	2019	Increase (Decrease)
Diluted EPS From Continuing Operations	**$8.55**	$7.94	$0.61
Facility closure	**—**	0.10	(0.10)
Cost reduction actions	**—**	0.08	(0.08)
Gain on exchange of equity affiliate investments	**—**	(0.13)	0.13
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	**—**	(0.06)	0.06
Tax reform adjustment related to deemed foreign dividends	**—**	0.26	(0.26)
Adjusted Diluted EPS From Continuing Operations	**$8.38**	$8.21	$0.17

2021 OUTLOOK

As COVID-19 continues, we remain focused on the safety and well-being of our people. We are committed to safely maintaining plant operations and ensuring business continuity, including providing financial security for employees, reliably supplying critical products and services to our customers, and winning new opportunities for world-scale projects.

We expect lower volumes from COVID-19 to continue into fiscal year 2021 with recovery in demand depending on the duration of COVID-19 and measures implemented by governments, public health authorities and businesses to mitigate its spread. Given the dynamic nature of these circumstances, the future impact on our ongoing business, results of operations, and overall financial performance cannot be reasonably estimated.

Despite the uncertainty of the duration of COVID-19, we will continue to focus on pricing discipline in our merchant business and expect our onsite business model, which represents approximately half of our business, to continue generating stable cash flow. This will allow us to execute our strategic focus on our industrial gas business and the creation of long-term shareholder value, including the ongoing growth of our dividend, continued execution of projects in our backlog, and new investments in high-return industrial gas projects.

A long-term onsite customer in Asia delayed restarting their plant following a planned major maintenance turnaround completed in September 2020. While we expect the plant to restart in fiscal year 2021, we are negotiating with the customer regarding contract terms that could impact sales in our Industrial Gases – Asia segment.

The above guidance should be read in conjunction with the *Forward-Looking Statements* of this Annual Report on Form 10-K.

RESULTS OF OPERATIONS

Discussion of Consolidated Results

	2020	2019	$ Change	Change
GAAP Measures				
Sales	**$8,856.3**	$8,918.9	($62.6)	(1) %
Operating income	**2,237.6**	2,144.4	93.2	4 %
Operating margin	**25.3 %**	24.0 %		130 bp
Equity affiliates' income	**$264.8**	$215.4	49.4	23 %
Net income	**1,931.1**	1,809.4	121.7	7 %
Net income margin	**21.8 %**	20.3 %		150 bp
Non-GAAP Measures				
Adjusted EBITDA	**$3,619.8**	$3,468.0	151.8	4 %
Adjusted EBITDA margin	**40.9 %**	38.9 %		200 bp

Sales

Sales % Change from Prior Year	
Volume	2 %
Price	3 %
Energy and natural gas cost pass-through	(4)%
Currency	(1)%
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 $8,856.3 decreased 1%, or $62.6, as higher pricing of 3% and favorable volumes of 2% were more than offset by lower energy and natural gas cost pass-through to customers of 4%, unfavorable currency of 1%, and the impact from the India contract modification of 1%. The pricing improvement was attributable to our merchant business across the regional segments. The volume growth exceeded the negative impacts from COVID-19 and was primarily driven by acquisitions, new plants, and higher sale of equipment project activity. We estimate that COVID-19 negatively impacted overall sales by approximately 4%, primarily driven by lower volumes in our merchant business across the regional segments as our onsite business remained stable. Unfavorable currency impacts were driven by the Chilean Peso, Chinese Renminbi, Euro, and South Korean Won.

Cost of Sales and Gross Margin

Cost of sales of $5,858.1 decreased 2%, or $146.4, from total cost of sales of $6,004.5 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 $314, positive currency impacts of $73, the favorable impact from the India contract modification of $41, and the prior year facility closure of $29, partially offset by higher costs attributable to sales volumes of $250 and higher other costs, including planned maintenance, of $61. Gross margin of 33.9% increased 120 bp from 32.7% in the prior year, primarily due to positive pricing, lower energy and natural gas cost pass-through to customers, and the prior year facility closure, partially offset by unfavorable volume mix and net operating costs.

Facility Closure

In fiscal year 2019, 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) primarily related to the write-off of onsite assets. This charge was reflected as “Facility closure” on our consolidated income statements for the fiscal year ended 30 September 2019 and was not recorded in segment results.

Selling and Administrative

Selling and administrative expense of $775.9 increased 3%, or $25.9, due to higher business development costs to support our growth strategy and higher incentive compensation, partially offset by currency impacts and lower travel expenses. Selling and administrative expense, as a percentage of sales, increased from 8.4% to 8.8%.

Research and Development

Research and development expense of $83.9 increased 15%, or $11.0, primarily due to higher product development costs. 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 fiscal year ended 30 September 2020 and was not recorded in segment results.

Cost Reduction Actions

In fiscal year 2019, we recognized an expense of $25.5 ($18.8 after-tax, or $0.08 per share) for severance and other benefits associated with position eliminations, primarily within the Industrial Gases – EMEA and the Industrial Gases – Americas segments. This expense was reflected as "Cost reduction actions" on our consolidated income statements for the fiscal year ended 30 September 2019 and was not recorded in segment results. Refer to Note 5, *Cost Reduction Actions*, to the consolidated financial statements for additional information.

Gain on Exchange of Equity Affiliate Investments

In fiscal year 2019, we recognized a net gain of $29.1 ($0.13 per share) resulting from the exchange of two 50%-owned industrial gas joint ventures in China. The net gain was reflected as "Gain on exchange of equity affiliate investments" on our consolidated income statements for the fiscal year ended 30 September 2019 and was not recorded in segment results. Refer to Note 3, *Acquisitions*, to the consolidated financial statements for additional information.

Other Income (Expense), Net

Other income (expense), net of $65.4 increased 33%, or $16.1, primarily due to the adjustment of a benefit plan liability resulting from a change in plan terms.

Operating Income and Margin

Operating income of $2,237.6 increased 4%, or $93.2, due to positive pricing, net of power and fuel costs, of $212, income associated with the company headquarters relocation of $34, and prior year charges for a facility closure of $29 and cost reduction actions of $26, partially offset by higher net operating costs of $104, including planned maintenance, unfavorable volume mix of $55, a gain on the exchange of equity affiliates of $29 in the prior year, and unfavorable currency of $20.

Operating margin of 25.3% increased 130 bp, primarily due to positive pricing, lower energy and natural gas cost pass-through to customers, the impact of income associated with the company headquarters relocation, and prior year charges for a facility closure and cost reduction actions, partially offset by unfavorable volume mix, higher operating costs, and a gain on the exchange of two equity affiliates in the prior year.

Equity Affiliates' Income

Equity affiliates' income of $264.8 increased 23%, or $49.4, 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 22, *Income Taxes*, to the consolidated financial statements for additional information. The current year also includes higher income from affiliates in India, Italy, and Saudi Arabia, partially offset by negative impacts from COVID-19.

Interest Expense

	2020	2019
Interest incurred	**$125.2**	$150.5
Less: Capitalized interest	**15.9**	13.5
Interest expense	**$109.3**	$137.0

Interest incurred decreased 17%, or $25.3. The prior year included an expense of $33.3 related to foreign currency forward points and currency swap basis differences ("excluded components") 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 incurred decreased due to lower expenses related to the Lu'An joint venture financing and a lower average interest rate on the debt portfolio, partially offset by a higher debt balance due to the issuance of debt during the third quarter of fiscal year 2020. Refer to Note 15, *Debt*, to the consolidated financial statements for additional information. We expect interest expense to be higher in future periods due to this issuance. Capitalized interest increased 18%, or $2.4, due to an increase in the carrying value of projects under construction.

Other Non-Operating Income (Expense), Net

Other non-operating income of $30.7 decreased 54%, or $36.0, primarily due to an expense of $33.5 for the excluded components of cash flow hedges of intercompany loans. These components were historically recorded in "Interest expense" prior to the adoption of the guidance discussed above. The current year also included lower interest income on cash and cash items. These factors were partially offset by higher non-service pension income due to lower interest cost and higher expected asset returns, primarily for our U.S. pension plans. The prior year includes a 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 17, *Commitments and Contingencies*, to the consolidated financial statements for additional information.

Net Income and Net Income Margin

Net income of $1,931.1 increased 7%, or $121.7, primarily due to higher pricing and income from the sale of property at our current corporate headquarters. In addition, the prior year was negatively impacted by a facility closure, cost reduction actions, and the U.S. Tax Cuts and Jobs Act. These factors were partially offset by higher costs, including the after-tax loss from discontinued operations, unfavorable volume mix, and a gain on the exchange of two equity affiliates in the prior year. Net income margin of 21.8% increased 150 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 $3,619.8 increased 4%, or $151.8, primarily due to higher pricing, partially offset by higher operating costs. Adjusted EBITDA margin of 40.9% increased 200 bp, primarily due to the higher pricing and lower energy and natural gas cost pass-through to customers, partially offset by unfavorable volume mix and higher 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 19.7% and 21.0% for the fiscal years ended 30 September 2020 and 2019, respectively.

The 2019 tax rate reflected a discrete net income tax expense of $43.8 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 ($0.26 per share) benefit recorded in 2018 related to the U.S. taxation of deemed foreign dividends. This was partially offset by a benefit of $12.4 ($0.06 per share) to finalize our estimates of the impacts of the Tax Act and reduce the total expected costs of the deemed repatriation tax. In addition, the net expense from the Tax Act was partially offset by benefits from changes in valuation allowance recorded at various entities in 2019.

The lower current year rate reflects favorable impacts from higher benefits on the revaluation of deferred tax accounts due to enacted changes in foreign tax law, changes in the tax profile of U.S. entities in various state jurisdictions, and higher excess tax benefits on share-based compensation. These items were partially offset by the enactment of the India Finance Act 2020 (the "India Finance Act"), which increased income tax expense by $20.3. The enactment also increased equity affiliates' income by $33.8 for changes in the future tax costs of repatriated earnings. The overall impact to net income resulting from the India Finance Act was a benefit of $13.5 ($0.06 per share).

The adjusted effective tax rate was 19.1% and 19.4% for the fiscal years ended 30 September 2020 and 2019, respectively. The lower current year rate reflects favorable impacts from higher benefits on the revaluation of deferred tax accounts due to enacted changes in foreign tax law, changes in the tax profile of U.S. entities in various state jurisdictions, and higher excess tax benefits on share-based compensation. These items were partially offset by benefits from changes in valuation allowances recorded at various entities in 2019.

Refer to Note 22, *Income Taxes*, to the consolidated financial statements for additional information.

Segment Analysis

Industrial Gases – Americas

Year Ended 30 September	**2020**	2019	$ Change	Change
Sales	**$3,630.7**	$3,873.5	($242.8)	(6)%
Operating income	**1,012.4**	997.7	14.7	1 %
Operating margin	**27.9 %**	25.8 %		210 bp
Equity affiliates' income	**$84.3**	$84.8	($0.5)	(1)%
Adjusted EBITDA	**1,656.2**	1,587.7	68.5	4 %
Adjusted EBITDA margin	**45.6 %**	41.0 %		460 bp

Sales % Change from Prior Year	
Volume	(1)%
Price	3 %
Energy and natural gas cost pass-through	(6)%
Currency	(2)%
Total Industrial Gases – Americas Sales Change	**(6)%**

Sales of $3,630.7 decreased 6%, or $242.8, as lower energy and natural gas cost pass-through to customers of 6%, a negative impact from currency of 2%, and lower volumes of 1% were partially offset by positive pricing of 3%. The pricing improvement was driven by our merchant business. Lower volumes, particularly in our merchant business, were primarily driven by COVID-19, which began impacting this segment at the end of March 2020 and continued through the end of the fiscal year. The negative impact of COVID-19 was partially offset by positive contributions from the commencement of a long-term hydrogen supply agreement with PBF Energy Inc. from assets we acquired in April. The unfavorable currency impact was driven by the Chilean Peso.

Operating income of $1,012.4 increased 1%, or $14.7, due to higher pricing, net of power and fuel costs, of $95, partially offset by higher net operating costs of $40, lower volumes of $33, and unfavorable currency impacts of $7. Operating margin of 27.9% increased 210 bp, primarily due to positive pricing and lower energy and natural gas cost pass-through to customers, partially offset by lower volumes and unfavorable net operating costs.

Equity affiliates' income of $84.3 decreased 1%, or $0.5.

Industrial Gases – EMEA

	2020	2019	$ Change	Change
Sales	**$1,926.3**	$2,002.5	($76.2)	(4)%
Operating income	**473.3**	472.4	0.9	— %
Operating margin	**24.6 %**	23.6 %		100 bp
Equity affiliates' income	**$74.8**	$69.0	$5.8	8 %
Adjusted EBITDA	**744.0**	730.9	13.1	2 %
Adjusted EBITDA margin	**38.6 %**	36.5 %		210 bp

Sales % Change from Prior Year	
Volume	— %
Price	3 %
Energy and natural gas cost pass-through	(4)%
Currency	(1)%
Other[(A)]	(2)%
Total Industrial Gases – EMEA Sales Change	**(4)%**

[(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 $1,926.3 decreased 4%, or $76.2, as lower energy and natural gas cost pass-through to customers of 4%, the negative impact from the India contract modification of 2%, and unfavorable currency impacts of 1% were only partially offset by positive pricing of 3%. The pricing improvement was attributable to our merchant business. Volumes were flat versus the prior year as improvements from acquisitions and demand for hydrogen in our Rotterdam pipeline system were offset by lower volumes from COVID-19, particularly in our merchant business. COVID-19 began impacting this segment at the end of March 2020 and continued through the end of the fiscal year. The negative currency impact was mainly driven by the Euro.

Operating income of $473.3 was flat as higher pricing, net of power and fuel costs, of $71 was offset by higher costs of $41, unfavorable volume mix of $27, and unfavorable currency impacts of $3. Operating margin of 24.6% increased 100 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 and unfavorable volume mix.

Equity affiliates' income of $74.8 increased 8%, or $5.8, primarily due to Jazan Gas Projects Company, which began to contribute in the second half of fiscal year 2019, and higher income from an affiliate in Italy.

Industrial Gases – Asia

	2020	2019	$ Change	Change
Sales	**$2,716.5**	$2,663.6	$52.9	2 %
Operating income	**870.3**	864.2	6.1	1 %
Operating margin	**32.0 %**	32.4 %		(40) bp
Equity affiliates' income	**$61.0**	$58.4	$2.6	4 %
Adjusted EBITDA	**1,330.7**	1,284.1	46.6	4 %
Adjusted EBITDA margin	**49.0 %**	48.2 %		80 bp

Sales % Change from Prior Year	
Volume	1 %
Price	2 %
Energy and natural gas cost pass-through	— %
Currency	(1)%
Total Industrial Gases – Asia Sales Change	**2 %**

Sales of $2,716.5 increased 2%, or $52.9, as positive pricing of 2% and higher volumes of 1% were partially offset by unfavorable currency impacts of 1%. Volume improvements from new plants were partially offset by negative impacts from planned maintenance outages, completion of a short-term supply contract, and COVID-19, which began impacting this segment in the second quarter and continued through the end of the fiscal year. The negative impact from COVID-19 was primarily on our merchant volumes. 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 $870.3 increased 1%, or $6.1, due to positive pricing, net of power and fuel costs, of $46 and favorable net operating costs of $4, partially offset by unfavorable volume mix of $33 and currency impacts of $11. Operating margin of 32.0% decreased 40 bp, as unfavorable volume mix more than offset positive pricing.

Equity affiliates' income of $61.0 increased 4%, or $2.6.

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.

	2020	2019	$ Change	Change
Sales	**$364.9**	$261.0	$103.9	40 %
Operating loss	**(40.0)**	(11.7)	(28.3)	(242)%
Adjusted EBITDA	**(19.5)**	0.1	(19.6)	N/M*

* Not meaningful

Sales of $364.9 increased 40%, or $103.9, primarily due to higher sale of equipment activity. Operating loss of $40.0 increased 242%, or $28.3, as higher project and product development costs were only partially offset by higher sale of equipment and other project activity.

Corporate and other

The Corporate and other segment includes our LNG, turbo machinery equipment and services, and distribution sale of equipment businesses as well as our 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.

	2020	2019	$ Change	Change
Sales	**$217.9**	$118.3	$99.6	84 %
Operating loss	**(112.2)**	(152.8)	40.6	27 %
Adjusted EBITDA	**(91.6)**	(134.8)	43.2	32 %

Sales of $217.9 increased 84%, or $99.6, primarily due to higher LNG sale of equipment activity. Operating loss of $112.2 decreased 27%, or $40.6, primarily due to the higher LNG sale of equipment 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)

We present 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, 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.

Our non-GAAP financial measures are not meant to be considered in isolation or as a substitute for the most directly comparable measure calculated in accordance with GAAP. We believe these non-GAAP financial measures provide investors, potential investors, securities analysts, and others with useful information to evaluate the performance of our 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 our historical financial performance and projected future results.

In many cases, non-GAAP financial measures are determined by adjusting the most directly comparable GAAP measure to exclude certain disclosed items, or “non-GAAP adjustments,” that we believe are not representative of underlying business performance. For example, we previously excluded certain expenses associated with cost reduction actions, impairment charges, and gains on disclosed transactions. The reader should be aware that we may recognize similar losses or gains in the future. Readers should also consider the limitations associated with these non-GAAP financial 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 we view 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. The per share impact for each non-GAAP adjustment was calculated independently and may not sum to total adjusted diluted EPS due to rounding.

Year Ended 30 September	Operating Income	Equity Affiliates' Income	Income Tax Provision	Net Income Attributable to Air Products	Diluted EPS
2020 GAAP	**$2,237.6**	**$264.8**	**$478.4**	**$1,901.0**	**$8.55**
2019 GAAP	**2,144.4**	**215.4**	**480.1**	**1,760.0**	**7.94**
Change GAAP				$141.0	$0.61
% Change GAAP				8 %	8 %
2020 GAAP	$2,237.6	$264.8	$478.4	$1,901.0	$8.55
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")	**$2,203.8**	**$231.0**	**$449.9**	**$1,861.9**	**$8.38**
2019 GAAP	$2,144.4	$215.4	$480.1	$1,760.0	$7.94
Facility closure	29.0	—	6.9	22.1	0.10
Cost reduction actions	25.5	—	6.7	18.8	0.08
Gain on exchange of equity affiliate investments	(29.1)	—	—	(29.1)	(0.13)
Pension settlement loss[(A)]	—	—	1.2	3.8	0.02
Tax reform repatriation	—	—	12.4	(12.4)	(0.06)
Tax reform adjustment related to deemed foreign dividends	—	—	(56.2)	56.2	0.26
2019 Non-GAAP Measure ("Adjusted")	**$2,169.8**	**$215.4**	**$451.1**	**$1,819.4**	**$8.21**
Change Non-GAAP Measure ("Adjusted")				$42.5	$0.17
% Change Non-GAAP Measure ("Adjusted")				2 %	2 %

(A) Before-tax impact of $5.0 is reflected on the consolidated income statements within “Other non-operating income (expense), net.”

The table below provides a reconciliation of adjusted diluted EPS to GAAP diluted EPS for each fiscal year noted:

Year Ended 30 September	2020	2019	2018	2017	2016
Diluted EPS	**$8.55**	**$7.94**	**$6.59**	**$5.16**	**$5.04**
Change in inventory valuation method	—	—	(0.08)	—	—
Facility closure	—	0.10	—	—	—
Business separation costs	—	—	—	0.12	0.21
Tax (benefit) costs associated with business separation	—	—	—	(0.02)	0.24
Cost reduction and asset actions	—	0.08	—	0.49	0.11
Goodwill and intangible asset impairment charge	—	—	—	0.70	—
Gain on exchange of equity affiliate investments	—	(0.13)	—	—	—
Company headquarters relocation (income) expense	(0.12)	—	—	—	—
Gain on land sale	—	—	—	(0.03)	—
India Finance Act 2020	(0.06)	—	—	—	—
Equity method investment impairment charge	—	—	—	0.36	—
Pension settlement loss	—	0.02	0.15	0.03	0.02
Loss on extinguishment of debt	—	—	—	—	0.02
Tax reform repatriation	—	(0.06)	2.16	—	—
Tax reform adjustment related to deemed foreign dividends	—	0.26	(0.25)	—	—
Tax reform rate change and other	—	—	(0.96)	—	—
Tax restructuring	—	—	(0.16)	—	—
Tax election benefit	—	—	—	(0.50)	—
Adjusted Diluted EPS	**$8.38**	**$8.21**	**$7.45**	**$6.31**	**$5.64**

ADJUSTED EBITDA AND ADJUSTED EBITDA MARGIN

We define adjusted EBITDA as net income less income (loss) from discontinued operations, net of tax, and excluding non-GAAP adjustments, which we do 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:

Year Ended 30 September	**2020**		2019		2018		2017		2016	
Sales	**$8,856.3**		$8,918.9		$8,930.2		$8,187.6		$7,503.7	
	$	**Margin**	$	Margin	$	Margin	$	Margin	$	Margin
Net income and net income margin	**$1,931.1**	**21.8 %**	$1,809.4	20.3 %	$1,532.9	17.2 %	$3,021.2	36.9 %	$661.5	8.8 %
Less: (Loss) Income from discontinued operations, net of tax	**(14.3)**	**(0.2)%**	—	— %	42.2	0.5 %	1,866.0	22.8 %	(460.5)	(6.1)%
Add: Interest expense	**109.3**	**1.2 %**	137.0	1.5 %	130.5	1.5 %	120.6	1.5 %	115.2	1.5 %
Less: Other non-operating income (expense), net	**30.7**	**0.3 %**	66.7	0.7 %	5.1	0.1 %	16.6	0.2 %	(5.4)	(0.1)%
Add: Income tax provision	**478.4**	**5.4 %**	480.1	5.4 %	524.3	5.9 %	260.9	3.2 %	432.6	5.8 %
Add: Depreciation and amortization	**1,185.0**	**13.4 %**	1,082.8	12.1 %	970.7	10.9 %	865.8	10.6 %	854.6	11.4 %
Less: Change in inventory valuation method	**—**	**— %**	—	— %	24.1	0.3 %	—	— %	—	— %
Add: Facility closure	**—**	**— %**	29.0	0.3 %	—	— %	—	— %	—	— %
Add: Business separation costs	**—**	**— %**	—	— %	—	— %	32.5	0.4 %	50.6	0.7 %
Add: Cost reduction and asset actions	**—**	**— %**	25.5	0.3 %	—	— %	151.4	1.8 %	34.5	0.4 %
Add: Goodwill and intangible asset impairment charge	**—**	**— %**	—	— %	—	— %	162.1	2.0 %	—	— %
Less: Gain on exchange of equity affiliate investments	**—**	**— %**	29.1	0.3 %	—	— %	—	— %	—	— %
Less: Company headquarters relocation income (expense)	**33.8**	**0.4 %**	—	— %	—	— %	—	— %	—	— %
Less: Gain on land sale	**—**	**— %**	—	— %	—	— %	12.2	0.2 %	—	— %
Less: India Finance Act 2020	**33.8**	**0.4 %**	—	— %	—	— %	—	— %	—	— %
Add: Equity method investment impairment charge	**—**	**— %**	—	— %	—	— %	79.5	1.0 %	—	— %
Add: Loss on extinguishment of debt	**—**	**— %**	—	— %	—	— %	—	— %	6.9	0.1 %
Add: Tax reform repatriation - equity method investment	**—**	**— %**	—	— %	28.5	0.3 %	—	— %	—	— %
Adjusted EBITDA and adjusted EBITDA margin	**$3,619.8**	**40.9 %**	$3,468.0	38.9 %	$3,115.5	34.9 %	$2,799.2	34.2 %	$2,621.8	34.9 %

Year Ended 30 September	**2020 vs. 2019**	2019 vs. 2018	2018 vs. 2017	2017 vs. 2016
Change GAAP				
Net income $ change	**$121.7**	$276.5	($1,488.3)	$2,359.7
Net income % change	**7%**	18%	(49)%	357%
Net income margin change	**150 bp**	310 bp	(1,970) bp	2,810 bp
Change Non-GAAP				
Adjusted EBITDA $ change	**$151.8**	$352.5	$316.3	$177.4
Adjusted EBITDA % change	**4%**	11%	11%	7%
Adjusted EBITDA margin change	**200 bp**	400 bp	70 bp	(70) bp

Below is reconciliation of operating income and operating margin by segment to adjusted EBITDA and adjusted EBITDA margin by segment:

Year Ended 30 September	Industrial Gases–Americas	Industrial Gases–EMEA	Industrial Gases–Asia	Industrial Gases–Global	Corporate and other	Total	
2020 GAAP Measures							
Operating income (loss)	$1,012.4	$473.3	$870.3	($40.0)	($112.2)	$2,203.8	(A)
Operating margin	27.9 %	24.6 %	32.0 %				
2019 GAAP Measures							
Operating income (loss)	$997.7	$472.4	$864.2	($11.7)	($152.8)	$2,169.8	(A)
Operating margin	25.8 %	23.6 %	32.4 %				
2020 vs. 2019							
Operating income/loss change	$14.7	$0.9	$6.1	($28.3)	$40.6		
Operating income/loss % change	1 %	— %	1 %	(242) %	27 %		
Operating margin change	210 bp	100 bp	(40) bp				
2020 Non-GAAP Measures							
Operating income (loss)	$1,012.4	$473.3	$870.3	($40.0)	($112.2)	$2,203.8	(A)
Add: Depreciation and amortization	559.5	195.9	399.4	9.6	20.6	1,185.0	
Add: Equity affiliates' income	84.3	74.8	61.0	10.9	—	231.0	(B)
Adjusted EBITDA	$1,656.2	$744.0	$1,330.7	($19.5)	($91.6)	$3,619.8	
Adjusted EBITDA margin	45.6 %	38.6 %	49.0 %				
2019 Non-GAAP Measures							
Operating income (loss)	$997.7	$472.4	$864.2	($11.7)	($152.8)	$2,169.8	(A)
Add: Depreciation and amortization	505.2	189.5	361.5	8.6	18.0	1,082.8	
Add: Equity affiliates' income	84.8	69.0	58.4	3.2	—	215.4	(B)
Adjusted EBITDA	$1,587.7	$730.9	$1,284.1	$0.1	($134.8)	$3,468.0	
Adjusted EBITDA margin	41.0 %	36.5 %	48.2 %				
2020 vs. 2019							
Adjusted EBITDA change	$68.5	$13.1	$46.6	($19.6)	$43.2		
Adjusted EBITDA % change	4 %	2 %	4 %	N/M*	32 %		
Adjusted EBITDA margin change	460 bp	210 bp	80 bp				

* Not meaningful

(A) The table below reconciles consolidated operating income as reflected on our consolidated income statements to total operating income disclosed in the table above for the years ended 30 September:

Operating Income	**2020**	2019
Consolidated operating income	**$2,237.6**	$2,144.4
Facility closure	**—**	29.0
Cost reduction actions	**—**	25.5
Gain on exchange of equity affiliate investments	**—**	(29.1)
Company headquarters relocation (income) expense	**(33.8)**	—
Total	**$2,203.8**	$2,169.8

(B) The table below reconciles consolidated equity affiliates' income as reflected on our consolidated income statements to total equity affiliates' income disclosed in the table above for the years ended 30 September:

Equity Affiliates' Income	**2020**	2019
Consolidated equity affiliates' income	**$264.8**	$215.4
India Finance Act 2020	**(33.8)**	—
Total	**$231.0**	$215.4

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.

	Effective Tax Rate	
Year Ended 30 September	2020	2019
Income Tax Provision	**$478.4**	**$480.1**
Income From Continuing Operations Before Taxes	**$2,423.8**	**$2,289.5**
Effective Tax Rate	**19.7 %**	**21.0 %**
Income Tax Provision	$478.4	$480.1
Facility closure	—	6.9
Cost reduction actions	—	6.7
Company headquarters relocation	(8.2)	—
India Finance Act 2020	(20.3)	—
Pension settlement loss	—	1.2
Tax reform repatriation	—	12.4
Tax reform adjustment related to deemed foreign dividends	—	(56.2)
Adjusted Income Tax Provision	**$449.9**	**$451.1**
Income From Continuing Operations Before Taxes	$2,423.8	$2,289.5
Facility closure	—	29.0
Cost reduction actions	—	25.5
Gain on exchange of equity affiliate investments	—	(29.1)
Company headquarters relocation (income) expense	(33.8)	—
India Finance Act 2020 - equity affiliate income impact	(33.8)	—
Pension settlement loss	—	5.0
Adjusted Income From Continuing Operations Before Taxes	**$2,356.2**	**$2,319.9**
Adjusted Effective Tax Rate	**19.1 %**	**19.4 %**

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. During the third quarter of fiscal year 2020, we issued U.S. Dollar- and Euro-denominated fixed-rate notes with aggregate principal amounts of $3.8 billion and €1.0 billion ($1.2 billion as of 30 September 2020), respectively. We intend to use the majority of the proceeds to fund growth projects and repay debt maturities through 2021, including a €350.0 million Eurobond due in June 2021. 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 30 September 2020, we had $1,376.6 of foreign cash and cash items compared to total cash and cash items of $5,253.0. Since the enactment of the Tax Act, we 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 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.

The table below summarizes our cash flows from operating, investing, and financing activities as reflected on the consolidated statements of cash flows for the years ended 30 September:

Cash Provided by (Used for)	**2020**	2019
Operating activities	**$3,264.7**	$2,969.9
Investing activities	**(3,560.0)**	(2,113.4)
Financing activities	**3,284.7**	(1,370.5)

Operating Activities

For the fiscal year ended 30 September 2020, cash provided by operating activities was $3,264.7. Income from continuing operations of $1,901.0 was adjusted for items including depreciation and amortization, deferred income taxes, undistributed earnings of unconsolidated affiliates, gain on sale of assets and investments, share-based compensation, noncurrent capital lease receivables, and certain other adjustments. We recorded a net benefit of $13.5 on our consolidated income statements related to a recently enacted tax law in India during the second quarter. This net benefit, which is further discussed in Note 22, *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 $45.8 includes a gain of $33.8 related to the sale of property at our current corporate headquarters. Refer to Note 23, *Supplemental Information*, to the consolidated financial statements for additional information. The working capital accounts were a use of cash of $40.1, primarily driven by other working capital uses of $130.6, partially offset by a source of $84.4 from other receivables. The use of cash within "Other working capital" was primarily due to timing of tax payments and a tax benefit as a result of the assets acquired in April 2020 from PBF Energy Inc. The source of cash within "Other receivables" was primarily driven by maturities of forward exchange contracts.

For the fiscal year ended 30 September 2019, cash provided by operating activities was $2,969.9, including income from continuing operations of $1,760.0. The gain on sale of assets and investments included a gain of $14.1 recognized on the disposition of our interest in High-Tech Gases (Beijing) Co., Ltd., a previously held equity investment in our Industrial Gases - Asia segment. Refer to Note 3, *Acquisitions*, to the consolidated financial statements for additional information. The working capital accounts were a use of cash of $25.3, primarily driven by $69.0 from trade receivables and $41.8 from payables and accrued liabilities, partially offset by $79.8 from other receivables. The use of cash within "Payables and accrued liabilities" was primarily driven by a $48.9 decrease in accrued utilities and a $30.3 decrease in accrued interest, partially offset by a $51.6 increase in customer advances primarily related to sale of equipment activity. The decrease in accrued utilities was primarily driven by a contract modification to a tolling arrangement in India and lower utility costs in the Industrial Gases – Americas segment. The source of cash from other receivables of $79.8 was primarily due to the maturities of forward exchange contracts that hedged foreign currency exposures and the collection of value added taxes.

Investing Activities

For the fiscal year ended 30 September 2020, cash used for investing activities was $3,560.0. Payments for additions to plant and equipment, including long-term deposits, were $2,509.0. This includes the acquisition of five operating hydrogen production plants from PBF Energy Inc. in Delaware and California for approximately $580 during the third quarter. Additionally, acquisitions, less cash acquired, includes $183.3 for three businesses we acquired on 1 July 2020, the largest of which was a business in Israel that primarily offers merchant gas products. Refer to Note 3, *Acquisitions*, to the consolidated financial statements for additional information. Purchases of investments of $2,865.5 relate to time deposits and treasury securities with terms greater than three months and less than one year and exceeded proceeds from investments of $1,938.0. Proceeds from sale of assets and investments of $80.3 includes net proceeds of $44.1 related to the sale of property at our current corporate headquarters in the second quarter.

For the fiscal year ended 30 September 2019, cash used for investing activities was $2,113.4. Payments for additions to plant and equipment totaled $1,989.7. Cash paid for acquisitions, net of cash acquired, was $123.2. Refer to Note 3, *Acquisitions*, to the consolidated financial statements for further details. Proceeds from investments of $190.5 resulting from maturities of short-term instruments with original maturities greater than three months and less than one year exceeded purchases of $172.1.

Capital Expenditures

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:

	2020	2019
Cash used for investing activities	**$3,560.0**	$2,113.4
Proceeds from sale of assets and investments	**80.3**	11.1
Purchases of investments	**(2,865.5)**	(172.1)
Proceeds from investments	**1,938.0**	190.5
Other investing activities	**3.9**	(14.3)
Capital Expenditures	**$2,716.7**	$2,128.6

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

	2020	2019
Additions to plant and equipment	**$2,509.0**	$1,989.7
Acquisitions, less cash acquired	**183.3**	123.2
Investments in and advances to unconsolidated affiliates	**24.4**	15.7
Capital Expenditures	**$2,716.7**	$2,128.6

Capital expenditures in fiscal year 2020 totaled $2,716.7 compared to $2,128.6 in fiscal year 2019. The increase of $588.1 was primarily due to the acquisition of the hydrogen production plants from PBF Energy Inc., as noted above. Additions to plant and equipment also included support capital of a routine, ongoing nature, including expenditures for distribution equipment and facility improvements.

2021 Outlook for Investing Activities

Due to the significant uncertainty that remains regarding the duration of COVID-19, the pace of recovery, and its negative impact on the global economy, we are not providing capital expenditure guidance for fiscal year 2021. We are monitoring our projects to determine whether capital spending and project onstream timing may be delayed for those currently under construction.

We anticipate capital expenditures to be funded principally with our current cash balance and cash generated from continuing operations. In addition, we intend to continue to evaluate (1) acquisitions of small- and medium-sized industrial gas companies or assets from other industrial gas companies; (2) purchases of existing industrial gas facilities from our customers to create long-term contracts under which we own and operate the plant and sell industrial gases to the customer based on a fixed fee; and (3) investment in large industrial gas projects driven by demand for more energy, cleaner energy, and emerging market growth.

Financing Activities

In fiscal year 2020, cash provided by financing activities was $3,284.7 as we successfully accessed the debt markets in April 2020 to support opportunities for growth projects and repay upcoming debt maturities. Long-term debt proceeds of $4,895.8, as further discussed below under "Financing and Capital Structure," were partially offset by dividend payments to shareholders of $1,103.6 and payments on long-term debt of $406.6 primarily related to the repayment of a 2.0% Eurobond of €300.0 million ($353.9) that matured on 7 August 2020. Other financing activities were a use of cash of $80.1 and included financing charges associated with the third quarter debt issuance.

For the fiscal year ended 2019, cash used for financing activities was $1,370.5. This use of cash was largely attributable to dividend payments to shareholders of $994.0 and payments on long-term debt of $428.6. Payments on long-term debt primarily related to the repayment of a 4.375% U.S. Senior Note of $400.0 that matured on 21 August 2019.

Financing and Capital Structure

Capital needs in fiscal year 2020 were satisfied primarily with cash from operations. Total debt increased from $3,326.0 at 30 September 2019 to $7,907.8 at 30 September 2020 due to the issuance of U.S. Dollar- and Euro-denominated fixed-rate notes in the third quarter, partially offset by the repayment of a 2.0% Eurobond. For additional information, refer to Note 15, *Debt*, to the consolidated financial statements. Similarly, cash and cash items and short-term investments increased from $2,248.7 and $166.0, respectively, at the end of 2019 to $5,253.0 and $1,104.9, respectively, at the end of 2020, primarily due to the issuance of the notes. The current year total debt balance includes $338.5 of related party debt associated with the Lu'An joint venture.

We have a $2,300.0 five-year 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 us and certain of our subsidiaries. The Credit Agreement provides us a source of liquidity and supports our commercial paper program. Our only financial covenant under the Credit Agreement is a maximum ratio of total debt to total capitalization, or total debt plus total equity, no greater than 70%. Total debt as of 30 September 2020 and 30 September 2019, expressed as a percentage of total capitalization was 38.9% and 22.6%, respectively. No borrowings were outstanding under the Credit Agreement as of 30 September 2020.

There were no commitments maintained by our foreign subsidiaries at 30 September 2020.

As of 30 September 2020, we are 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. We did not purchase any of our outstanding shares during fiscal years 2020 or 2019. As of 30 September 2020, $485.3 in share repurchase authorization remains.

Dividends

Dividends are declared by the Board of Directors and are usually paid during the sixth week after the close of the fiscal quarter. In 2020, the Board of Directors increased our quarterly dividend by over 15% from $1.16 to $1.34 per share, representing the largest dividend increase in our 80-year history. This is the 38th consecutive year that we have increased our quarterly dividend payment.

On 19 November 2020, the Board of Directors declared the first quarter 2021 dividend of $1.34 per share. The dividend is payable on 8 February 2021 to shareholders of record as of 4 January 2021.

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. The following table summarizes our obligations on a continuing operations basis as of 30 September 2020:

	Total	2021	2022	2023	2024	2025	Thereafter
Debt maturities	$7,950	$470	$442	$456	$456	$416	$5,710
Contractual interest on debt	1,772	155	141	129	121	102	1,124
Operating leases	475	79	56	47	37	30	226
Pension obligations	598	51	45	42	42	28	390
Unconditional purchase obligations	9,556	1,460	460	450	455	454	6,277
Deemed repatriation tax related to the Tax Act	211	21	21	21	39	50	59
Obligation for future contribution to an equity affiliate	100	100	—	—	—	—	—
Total Contractual Obligations	**$20,662**	**$2,336**	**$1,165**	**$1,145**	**$1,150**	**$1,080**	**$13,786**

Debt Obligations

Our debt obligations include the maturity payments of the principal amount of long-term debt, including the current portion and amounts owed to related parties, and the related contractual interest obligations. Refer to Note 15, *Debt*, to the consolidated financial statements for additional information on our debt obligations.

Contractual interest is the interest we are contracted to pay on our debt obligations without taking into account the interest impact of interest rate swaps related to any of this debt, which at current interest rates would slightly decrease contractual interest. We had approximately $632 of long-term debt subject to variable interest rates at 30 September 2020, excluding fixed-rate debt that has been swapped to variable-rate debt. The rate assumed for the variable interest component of the contractual interest obligation was the rate in effect at 30 September 2020. Variable interest rates are primarily determined by U.S. short-term tax-exempt interest rates and by interbank offer rates.

Leases

We are the lessee under various agreements for real estate, vehicles, aircraft, and other equipment. Refer to Note 12, *Leases*, to the consolidated financial statements for additional information.

Pension Obligations

The amounts in the table above represent the current estimated cash payments to be made by us that, in total, equal the recognized pension liabilities for our U.S. and international pension plans. For additional information, refer to Note 16, *Retirement Benefits*, to the consolidated financial statements. These payments are based upon the current valuation assumptions and regulatory environment.

The total accrued liability for pension benefits may be impacted by interest rates, plan demographics, actual return on plan assets, continuation or modification of benefits, and other factors. Such factors can significantly impact the amount of the liability and related contributions.

Unconditional Purchase Obligations

We are obligated to make future payments under unconditional purchase obligations, which primarily relate to helium and rare gases as well as commitments for purchases of plant and equipment. For additional information, refer to Note 17, *Commitments and Contingencies*, to the consolidated financial statements.

Income Tax Liabilities

Tax liabilities related to unrecognized tax benefits as of 30 September 2020 were $237.0. These tax liabilities are not included in the table above as it is impractical to determine a cash impact by year given that payments will vary according to changes in tax laws, tax rates, and our operating results. In addition, there are uncertainties in timing of the effective settlement of our uncertain tax positions with respective taxing authorities. However, the table above includes our accrued liability of approximately $211 for deemed repatriation tax that is payable through 2026 related to the Tax Act. Refer to Note 22, *Income Taxes*, to the consolidated financial statements for additional information.

Obligation for Future Contribution to an Equity Affiliate

On 19 April 2015, a joint venture between Air Products and ACWA Holding entered into a 20-year oxygen and nitrogen supply agreement to supply Saudi Aramco’s oil refinery and power plant being built in Jazan, Saudi Arabia. We guaranteed the repayment of our 25% share of an equity bridge loan that has been provided to fund equity commitments to the joint venture. In total, we expect to invest approximately $100 in this joint venture. As of 30 September 2020, our consolidated balance sheets included $94.4 reflected within "Payables and accrued liabilities" for our obligation to make future equity contributions in 2021 based on our proportionate share of the advances received by the joint venture under the loan.

Future Investment in Jazan Gas and Power Project

On 12 August 2018, Air Products entered an agreement to form a gasification/power joint venture ("JV") with Saudi Aramco and ACWA in Jazan, Saudi Arabia. Air Products expects to own 51% of the JV, with Saudi Aramco and ACWA Power owning the balance. In July 2020, we commenced the process to secure project financing with our partners for the JV, which will purchase the gasification assets, power block, and the associated utilities from Saudi Aramco for approximately $12 billion. Our future investment is not considered a contractual obligation until definitive agreements have been signed; therefore, it is not included in the contractual obligations table above.

PENSION BENEFITS

We and certain of our subsidiaries sponsor defined benefit pension plans and defined contribution plans that cover a substantial portion of its worldwide employees. The principal defined benefit pension plans are the U.S. salaried pension plan and the U.K. pension plan. These plans were closed to new participants in 2005, after which defined contribution plans were offered to new employees. The shift to defined contribution plans is expected to continue to reduce volatility of both plan expense and contributions.

The fair market value of plan assets for our defined benefit pension plans as of the 30 September 2020 measurement date increased to $4,775.1 from $4,504.8 at the end of fiscal year 2019. The projected benefit obligation for these plans was $5,373.5 and $5,145.6 at the end of fiscal years 2020 and 2019, respectively. The net unfunded liability decreased $42.4 from $640.8 to $598.4, primarily due to favorable asset experience. Refer to Note 16, *Retirement Benefits*, to the consolidated financial statements for additional disclosures on our postretirement benefits.

Pension Expense

	2020	2019
Pension expense, including special items noted below	**$7.0**	$27.6
Settlements, termination benefits, and curtailments ("special items")	**5.2**	7.2
Weighted average discount rate – Service cost	**2.4 %**	3.4 %
Weighted average discount rate – Interest cost	**2.3 %**	3.4 %
Weighted average expected rate of return on plan assets	**6.3 %**	6.4 %
Weighted average expected rate of compensation increase	**3.4 %**	3.5 %

Pension expense decreased from the prior year due to lower interest cost and higher total assets, partially offset by higher actuarial loss amortization due to the impact of lower discount rates. Special items (settlements, termination benefits, and curtailments) decreased from the prior year primarily due to lower pension settlement losses. In fiscal year 2020, special items of $5.2 included pension settlement losses of $5.0 related to lump sum payouts from the U.S. Supplementary Pension Plan. These amounts are reflected within "Other non-operating income (expense), net" on the consolidated income statements. In fiscal year 2019, special items of $7.2 included pension settlement losses of $6.4 related to lump sum payouts from the U.S. Supplementary Pension Plan and $0.8 of termination benefits.

U.K. Lloyds 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.

2021 Outlook

In fiscal year 2021, we expect pension income of approximately $25 to $35, which includes expected pension settlement losses of $0 to $5, depending on the timing of retirements. The expected income range reflects lower expected interest cost and higher total assets. In fiscal year 2021, we expect our net pension income to include approximately $100 for amortization of actuarial losses.

In fiscal year 2020, pension expense included amortization of actuarial losses of $103.2. Net actuarial losses of $83.5 were recognized in accumulated other comprehensive income in fiscal year 2020. Actuarial (gains) losses are amortized into pension expense over prospective periods to the extent they are not offset by future gains or losses. Future changes in the discount rate and actual returns on plan assets different from expected returns would impact the actuarial (gains) losses and resulting amortization in years beyond fiscal year 2021.

Pension Funding

Pension funding includes both contributions to funded plans and benefit payments for unfunded plans, which are primarily non-qualified plans. With respect to funded plans, our funding policy is that contributions, combined with appreciation and earnings, will be sufficient to pay benefits without creating unnecessary surpluses.

In addition, we make contributions to satisfy all legal funding requirements while managing our capacity to benefit from tax deductions attributable to plan contributions. With the assistance of third-party actuaries, we analyze the liabilities and demographics of each plan, which help guide the level of contributions. During 2020 and 2019, our cash contributions to funded plans and benefit payments for unfunded plans were $37.5 and $40.2, respectively.

For fiscal year 2021, cash contributions to defined benefit plans are estimated to be $45 to $55. The estimate is based on expected contributions to certain international plans and anticipated benefit payments for unfunded plans, which are dependent upon the timing of retirements. Actual future contributions will depend on future funding legislation, discount rates, investment performance, plan design, and various other factors. We do not expect COVID-19 to impact our contribution forecast for fiscal year 2021. Refer to the Contractual Obligations discussion on page 38 for a projection of future contributions.

ENVIRONMENTAL MATTERS

As discussed above in Item 1, "*Business–Environmental Regulation*", we are subject to various environmental laws and regulations in the countries in which we have operations, which results in higher capital expenditures and costs. The amounts charged to income from continuing operations related to environmental matters totaled $18.3 and $14.2 in fiscal years 2020 and 2019, respectively. These amounts represent an estimate of expenses for compliance with environmental laws and activities undertaken to meet our internal standards. We estimate that we spent approximately $4 and $5, in fiscal years 2020 and 2019, respectively, on capital projects reflected in continuing operations to control pollution. We expect that our capital expenditures to control pollution will be approximately $6 in both fiscal years 2021 and 2022.

Our accounting policy for environmental expenditures is discussed in Note 1, *Major Accounting Policies*, to the consolidated financial statements, and environmental loss contingencies are discussed in Note 17, *Commitments and Contingencies*, to the consolidated financial statements.

OFF-BALANCE SHEET ARRANGEMENTS

We have entered into certain guarantee agreements as discussed in Note 17, *Commitments and Contingencies*, to the consolidated financial statements. In addition, 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 23, *Supplemental Information*, to the consolidated financial statements for information concerning activity with our related parties.

INFLATION

We operate in many countries that experience volatility in inflation and foreign exchange rates. The ability to pass on inflationary cost increases is an uncertainty due to general economic conditions and competitive situations. It is estimated that the cost of replacing our plant and equipment today is greater than its historical cost. Accordingly, depreciation expense would be greater if the expense were stated on a current cost basis.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Note 1, *Major Accounting Policies*, to the consolidated financial statements describes our major accounting policies. Judgments and estimates of uncertainties are required in applying our accounting policies in many areas. However, application of the critical accounting policies discussed below requires management's significant judgments, often as the result of the need to make estimates of matters that are inherently uncertain. If actual results were to differ materially from the estimates made, the reported results could be materially affected. Our management has reviewed these critical accounting policies and estimates and related disclosures with our audit committee.

Depreciable Lives of Plant and Equipment

Net plant and equipment at 30 September 2020 totaled $11,964.7, and depreciation expense totaled $1,150.5 during fiscal year 2020. Plant and equipment is recorded at cost and depreciated using the straight-line method, which deducts equal amounts of the cost of each asset from earnings every year over its estimated economic useful life.

Economic useful life is the duration of time an asset is expected to be productively employed by us, which may be less than its physical life. Assumptions on the following factors, among others, affect the determination of estimated economic useful life: wear and tear, obsolescence, technical standards, contract life, market demand, competitive position, raw material availability, and geographic location.

The estimated economic useful life of an asset is monitored to determine its appropriateness, especially when business circumstances change. For example, changes in technology, changes in the estimated future demand for products, excessive wear and tear, or unanticipated government actions may result in a shorter estimated useful life than originally anticipated. In these cases, we would depreciate the remaining net book value over the new estimated remaining life, thereby increasing depreciation expense per year on a prospective basis. Likewise, if the estimated useful life is increased, the adjustment to the useful life decreases depreciation expense per year on a prospective basis.

The regional Industrial Gases segments have numerous long-term customer supply contracts for which we construct an on-site plant adjacent to or near the customer's facility. These contracts typically have initial contract terms of 10 to 20 years. Depreciable lives of the production assets related to long-term supply contracts are matched to the contract lives. Extensions to the contract term of supply frequently occur prior to the expiration of the initial term. As contract terms are extended, the depreciable life of the associated production assets is adjusted to match the new contract term, as long as it does not exceed the remaining physical life of the asset.

Our regional Industrial Gases segments also have contracts for liquid or gaseous bulk supply and, for smaller customers, packaged gases. The depreciable lives of production facilities associated with these contracts are generally 15 years. These depreciable lives have been determined based on historical experience combined with judgment on future assumptions such as technological advances, potential obsolescence, competitors' actions, etc.

In addition, we may purchase assets through transactions accounted for as either an asset acquisition or a business combination. Depreciable lives are assigned to acquired assets based on the age and condition of the assets, the remaining duration of long-term supply contracts served by the assets, and our historical experience with similar assets. Management monitors its assumptions and may potentially need to adjust depreciable life as circumstances change.

Impairment of Assets

While our results of operations have been negatively affected by COVID-19 as of and for the fiscal year ended 30 September 2020, there have been no triggering events that would require impairment testing for any of our asset groups, reporting units that contain goodwill, indefinite-lived intangible assets, or equity method investments. As further discussed below, we completed our annual impairment tests and concluded there were no indications of impairment. We will continue to evaluate the nature and extent of COVID-19 impacts on our business and any impact they may have on management's estimates, particularly those for our Latin America business. The duration and severity of the COVID-19 outbreak and its long-term impact on our business is uncertain.

Impairment of Assets – Plant and Equipment

Plant and equipment meeting the held for sale criteria are reported at the lower of carrying amount or fair value less cost to sell. Plant and equipment to be disposed of other than by sale may be reviewed for impairment upon the occurrence of certain triggering events, such as unexpected contract terminations or unexpected foreign government-imposed restrictions or expropriations. Plant and equipment held for use is grouped for impairment testing at the lowest level for which there is identifiable cash flows. Impairment testing of the asset group occurs whenever events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. Such circumstances would include a significant decrease in the market value of a long-lived asset grouping, a significant adverse change in the manner in which the asset grouping is being used or in its physical condition, an accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of the long-lived asset, a history of operating or cash flow losses associated with the use of the asset grouping, or changes in the expected useful life of the long-lived assets.

If such circumstances are determined to exist, an estimate of undiscounted future cash flows produced by that asset group is compared to the carrying value to determine whether impairment exists. If an asset group is determined to be impaired, the loss is measured based on the difference between the asset group’s fair value and its carrying value. An estimate of the asset group’s fair value is based on the discounted value of its estimated cash flows.

The assumptions underlying the undiscounted future cash flow projections require significant management judgment. Factors that management must estimate include industry and market conditions, sales volume and prices, costs to produce, inflation, etc. The assumptions underlying the cash flow projections represent management’s best estimates at the time of the impairment review and could include probability weighting of cash flow projections associated with multiple potential future scenarios. Changes in key assumptions or actual conditions that differ from estimates could result in an impairment charge. We use reasonable and supportable assumptions when performing impairment reviews and cannot predict the occurrence of future events and circumstances that could result in impairment charges.

In fiscal year 2020, there was no need to test for impairment on any of our asset groupings as no events or changes in circumstances indicated that the carrying amount of the asset groupings may not be recoverable.

Impairment of Assets – Goodwill

The acquisition method of accounting for business combinations requires us to make use of estimates and judgments to allocate the purchase price paid for acquisitions to the fair value of the net tangible and identifiable intangible assets. Goodwill represents the excess of the aggregate purchase price (plus the fair value of any noncontrolling interest and previously held equity interest in the acquiree) over the fair value of identifiable net assets of an acquired entity. Goodwill was $891.5 as of 30 September 2020. Disclosures related to goodwill are included in Note 10, *Goodwill*, to the consolidated financial statements.

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. The tests are done at the reporting unit level, which is defined as being equal to or one level below the operating segment for which discrete financial information is available and whose operating results are reviewed by segment managers regularly. We have five reportable business segments, seven operating segments and ten reporting units, seven of which include a goodwill balance. Refer to Note 25, *Business Segment and Geographic Information*, for additional information. Reporting units are primarily based on products and subregions within each reportable segment. The majority of our goodwill is assigned to reporting units within our regional Industrial Gases segments.

As part of the goodwill impairment testing, we have the option to first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. However, we choose to bypass the qualitative assessment and conduct quantitative testing to determine if the carrying value of the reporting unit exceeds its fair value. An impairment loss will be recognized for the amount by which the carrying value of the reporting unit exceeds its fair value, not to exceed the total amount of goodwill allocated to that reporting unit.

To determine the fair value of a reporting unit, we initially use an income approach valuation model, representing the present value of estimated future cash flows. Our valuation model uses a discrete growth period and an estimated exit trading multiple. The income approach is an appropriate valuation method due to our capital-intensive nature, the long-term contractual nature of our business, and the relatively consistent cash flows generated by our reporting units. The principal assumptions utilized in our income approach valuation model include revenue growth rates, operating profit and/or adjusted EBITDA margins, discount rate, and exit multiple. Projected revenue growth rates and operating profit and/or adjusted EBITDA assumptions are consistent with those utilized in our operating plan and/or revised forecasts and long-term financial planning process. The discount rate assumption is calculated based on an estimated market-participant risk-adjusted weighted-average cost of capital, which includes factors such as the risk-free rate of return, cost of debt, and expected equity premiums. The exit multiple is determined from comparable industry transactions and where appropriate, reflects expected long-term growth rates.

If our initial review under the income approach indicates there may be impairment, we incorporate results under the market approach to further evaluate the existence of impairment. When the market approach is utilized, fair value is estimated based on market multiples of revenue and earnings derived from comparable publicly-traded industrial gases companies and/or regional manufacturing companies engaged in the same or similar lines of business as the reporting unit, adjusted to reflect differences in size and growth prospects. When both the income and market approach are utilized, we review relevant facts and circumstances and make a qualitative assessment to determine the proper weighting. Management judgment is required in the determination of each assumption utilized in the valuation model, and actual results could differ from the estimates.

During the fourth quarter of fiscal year 2020, we conducted our annual goodwill impairment test. We determined that the fair value of all our reporting units substantially exceeded their carrying value except for our Latin America reporting unit (LASA), which is further discussed below. Substantially all of the remaining goodwill balance related to reporting units in which the fair value exceeded the carrying value by at least 100%.

The fair value of LASA exceeded its carrying value by 10%. Revenue growth and adjusted EBITDA margin assumptions are two primary drivers of the fair value. We determined that, with other assumptions held constant, a decrease in revenue growth rates of approximately 320 basis points or a decrease in adjusted EBITDA margin of approximately 290 basis points would result in the fair value of the reporting unit being equal to its carrying value. As of 30 September 2020, the carrying value of LASA goodwill was $56.1, or less than 1% of consolidated total assets. The carrying value of LASA's other material assets at 30 September 2020 included: Plant and equipment, net of $309.2; customer relationships of $112.1; and trade names and trademarks of $38.2. The trade names and trademarks are classified as indefinite-lived intangible assets.

Future events that could have a negative impact on the level of excess fair value over carrying value of the reporting units include, but are not limited to: long-term economic weakness, decline in market share, pricing pressures, inability to successfully implement cost improvement measures, increases to our cost of capital, changes in the strategy of the reporting unit, and changes to the structure of our business as a result of future reorganizations or divestitures of assets or businesses. Negative changes in one or more of these factors, among others, could result in impairment charges.

Impairment of Assets – Intangible Assets

Intangible assets, net with determinable lives at 30 September 2020 totaled $394.8 and consisted primarily of customer relationships, purchased patents and technology, and land use rights. These intangible assets are tested for impairment as part of the long-lived asset grouping impairment tests. Impairment testing of the asset group occurs whenever events or changes in circumstances indicate that the carrying value of the assets may not be recoverable. See the impairment discussion above under "*Impairment of Assets – Plant and Equipment*" for a description of how impairment losses are determined.

Indefinite-lived intangible assets at 30 September 2020 totaled $41.0 and consisted of trade names and trademarks. Indefinite-lived intangibles are subject to impairment testing at least annually or more frequently if events or changes in circumstances indicate that potential impairment exists. The impairment test for indefinite-lived intangible assets involves calculating the fair value of the indefinite-lived intangible assets and comparing the fair value to their carrying value. If the fair value is less than the carrying value, the difference is recorded as an impairment loss. To determine fair value, we utilize the royalty savings method, a form of the income approach. This method values an intangible asset by estimating the royalties avoided through ownership of the asset.

Disclosures related to intangible assets other than goodwill are included in Note 11, *Intangible Assets*, to the consolidated financial statements.

In the fourth quarter of 2020, we conducted our annual impairment test of indefinite-lived intangibles which resulted in no impairment.

Impairment of Assets – Equity Method Investments

Investments in and advances to equity affiliates totaled $1,432.2 at 30 September 2020. The majority of our investments are non-publicly traded ventures with other companies in the industrial gas business. Summarized financial information of equity affiliates is included in Note 8, *Summarized Financial Information of Equity Affiliates*, to the consolidated financial statements. Equity investments are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the investment may not be recoverable.

An impairment loss is recognized in the event that an other-than-temporary decline in fair value below the carrying value of an investment occurs. Management's estimate of fair value of an investment is based on the income approach and/or market approach. We utilize estimated discounted future cash flows expected to be generated by the investee under the income approach. For the market approach, we utilize market multiples of revenue and earnings derived from comparable publicly-traded industrial gases companies. Changes in key assumptions about the financial condition of an investee or actual conditions that differ from estimates could result in an impairment charge.

In fiscal year 2020, there was no need to test any of our equity affiliate investments for impairment, as no events or changes in circumstances indicated that the carrying amount of the investments may not be recoverable.

Revenue Recognition – Cost Incurred Input Method

Revenue from equipment sale contracts is generally recognized over time as we have an enforceable right to payment for performance completed to date and our performance under the contract terms does not create an asset with alternative use. We use a cost incurred input method to recognize revenue by which costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer.

Accounting for contracts using the cost incurred input method requires management judgment relative to assessing risks and their impact on the estimate of revenues and costs. Our estimates are impacted by factors such as the potential for incentives or penalties on performance, schedule and technical issues, labor productivity, the complexity of work performed, the cost and availability of materials, and performance of subcontractors. When adjustments in estimated total contract revenues or estimated total costs are required, any changes in the estimated profit from prior estimates are recognized in the current period for the inception-to-date effect of such change. When estimates of total costs to be incurred on a contract exceed estimates of total revenues to be earned, a provision for the entire estimated loss on the contract is recorded in the period in which the loss is determined.

In addition to the typical risks associated with underlying performance of project procurement and construction activities, our sale of equipment projects within our Industrial Gases – Global segment require monitoring of risks associated with schedule, geography, and other aspects of the contract and their effects on our estimates of total revenues and total costs to complete the contract.

Changes in estimates on projects accounted for under the cost incurred input method, including the Jazan project, favorably impacted operating income by approximately $7 and $37 in fiscal years 2020 and 2019, respectively. Our changes in estimates would not have significantly impacted amounts recorded in prior years.

We assess the performance of our sale of equipment projects as they progress. Our earnings could be positively or negatively impacted by changes to our forecast of revenues and costs on these projects.

Revenue Recognition – *On-site Customer Contracts*

For customers who require large volumes of gases on a long-term basis, we produce and supply gases under long-term contracts from large facilities that we build, own and operate on or near the customer's facilities. Certain of these on-site contracts contain complex terms and provisions such as tolling arrangements, minimum payment requirements, variable components and pricing provisions that require significant judgment to determine the amount and timing of revenue recognition.

Income Taxes

We account for income taxes under the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the tax effects of temporary differences between the financial reporting and tax bases of assets and liabilities measured using enacted tax rates in effect for the year in which the differences are expected to be recovered or settled. As of 30 September 2020, accrued income taxes, including the amount recorded as noncurrent, was $296.7, and net deferred tax liabilities were $847.5. Tax liabilities related to uncertain tax positions as of 30 September 2020 were $237.0, excluding interest and penalties. Income tax expense for the fiscal year ended 30 September 2020 was $478.4. Disclosures related to income taxes are included in Note 22, *Income Taxes*, to the consolidated financial statements.

Management judgment is required concerning the ultimate outcome of tax contingencies and the realization of deferred tax assets.

Actual income taxes paid may vary from estimates, depending upon changes in income tax laws, actual results of operations, and the final audit of tax returns by taxing authorities. Tax assessments may arise several years after tax returns have been filed. We believe that our recorded tax liabilities adequately provide for these assessments.

Deferred tax assets are recorded for operating losses and tax credit carryforwards. However, when we do not expect sufficient sources of future taxable income to realize the benefit of the operating losses or tax credit carryforwards, these deferred tax assets are reduced by a valuation allowance. A valuation allowance is recognized if, based on the weight of available evidence, it is considered more likely than not that some portion or all of the deferred tax asset will not be realized. The factors used to assess the likelihood of realization include forecasted future taxable income and available tax planning strategies that could be implemented to realize or renew net deferred tax assets in order to avoid the potential loss of future tax benefits. The effect of a change in the valuation allowance is reported in the income tax expense.

A 1% increase or decrease in our effective tax rate may result in a decrease or increase to net income, respectively, of approximately $24.

Pension and Other Postretirement Benefits

The amounts recognized in the consolidated financial statements for pension and other postretirement benefits are determined on an actuarial basis utilizing numerous assumptions. The discussion that follows provides information on the significant assumptions and expense associated with the defined benefit plans.

Actuarial models are used in calculating the expense and liability related to the various defined benefit plans. These models have an underlying assumption that the employees render service over their service lives on a relatively consistent basis; therefore, the expense of benefits earned should follow a similar pattern.

Several assumptions and statistical variables are used in the models to calculate the expense and liability related to the plans. We determine assumptions about the discount rate, the expected rate of return on plan assets, and the rate of compensation increase. Note 16, *Retirement Benefits*, to the consolidated financial statements includes disclosure of these rates on a weighted-average basis for both the U.S. and international plans. The actuarial models also use assumptions about demographic factors such as retirement age, mortality, and turnover rates. Mortality rates are based on the most recent U.S. and international mortality tables. We believe the actuarial assumptions are reasonable. However, actual results could vary materially from these actuarial assumptions due to economic events and differences in rates of retirement, mortality, and turnover.

One of the assumptions used in the actuarial models is the discount rate used to measure benefit obligations. This rate reflects the prevailing market rate for high-quality, fixed-income debt instruments with maturities corresponding to the expected timing of benefit payments as of the annual measurement date for each of the various plans. We measure the service cost and interest cost components of pension expense by applying spot rates along the yield curve to the relevant projected cash flows. The rates along the yield curve are used to discount the future cash flows of benefit obligations back to the measurement date. These rates change from year to year based on market conditions that affect corporate bond yields. A higher discount rate decreases the present value of the benefit obligations and results in lower pension expense. A 50 bp increase or decrease in the discount rate may result in a decrease or increase to pension expense, respectively, of approximately $26 per year.

The expected rate of return on plan assets represents an estimate of the long-term average rate of return to be earned by plan assets reflecting current asset allocations. In determining estimated asset class returns, we take into account historical and future expected long-term returns and the value of active management, as well as the interest rate environment. Asset allocation is determined based on long-term return, volatility and correlation characteristics of the asset classes, the profiles of the plans' liabilities, and acceptable levels of risk. Lower returns on the plan assets result in higher pension expense. A 50 bp increase or decrease in the estimated rate of return on plan assets may result in a decrease or increase to pension expense, respectively, of approximately $22 per year.

We use a market-related valuation method for recognizing certain investment gains or losses for our significant pension plans. Investment gains or losses are the difference between the expected return and actual return on plan assets. The expected return on plan assets is determined based on a market-related value of plan assets. For equities, this is a calculated value that recognizes investment gains and losses in fair value related to equities over a five-year period from the year in which they occur and reduces year-to-year volatility. The market-related value for non-equity investments equals the actual fair value. Expense in future periods will be impacted as gains or losses are recognized in the market-related value of assets.

The expected rate of compensation increase is another key assumption. We determine this rate based on review of the underlying long-term salary increase trend characteristic of labor markets and historical experience, as well as comparison to peer companies. A 50 bp increase or decrease in the expected rate of compensation may result in an increase or decrease to pension expense, respectively, of approximately $12 per year.

Loss Contingencies

In the normal course of business, we encounter contingencies, or situations involving varying degrees of uncertainty as to the outcome and effect on our company. We accrue a liability for loss contingencies when it is considered probable that a liability has been incurred and the amount of loss can be reasonably estimated. When only a range of possible loss can be established, the most probable amount in the range is accrued. If no amount within this range is a better estimate than any other amount within the range, the minimum amount in the range is accrued.

Contingencies include those associated with litigation and environmental matters, for which our accounting policy is discussed in Note 1, *Major Accounting Policies*, to the consolidated financial statements, and details are provided in Note 17, *Commitments and Contingencies*, to the consolidated financial statements. Significant judgment is required to determine both the probability and whether the amount of loss associated with a contingency can be reasonably estimated. These determinations are made based on the best available information at the time. As additional information becomes available, we reassess probability and estimates of loss contingencies. Revisions to the estimates associated with loss contingencies could have a significant impact on our results of operations in the period in which an accrual for loss contingencies is recorded or adjusted. For example, due to the inherent uncertainties related to environmental exposures, a significant increase to environmental liabilities could occur if a new site is designated, the scope of remediation is increased, a different remediation alternative is identified, or our proportionate share of the liability increases. Similarly, a future charge for regulatory fines or damage awards associated with litigation could have a significant impact on our net income in the period in which it is recorded.

NEW ACCOUNTING GUIDANCE

See Note 2, *New Accounting Guidance*, and Note 12, *Leases*, to the consolidated financial statements for information concerning the implementation and impact of new accounting guidance.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Our earnings, cash flows, and financial position are exposed to market risks arising from fluctuations in interest rates and foreign currency exchange rates. It is our policy to minimize our cash flow exposure to adverse changes in currency exchange rates and to manage the financial risks inherent in funding with debt capital.

We address these financial exposures through a controlled program of risk management that includes the use of derivative financial instruments. We have established counterparty credit guidelines and generally enter into transactions with financial institutions of investment grade or better, thereby minimizing the risk of credit loss. All instruments are entered into for other than trading purposes. For details on the types and use of these derivative instruments and related major accounting policies, refer to Note 1, *Major Accounting Policies*, and Note 13, *Financial Instruments*, to the consolidated financial statements. Additionally, we mitigate adverse energy price impacts through our cost pass-through contracts with customers and price increases.

Our derivative and other financial instruments consist of long-term debt, including the current portion and amounts owed to related parties; interest rate swaps; cross currency interest rate swaps; and foreign exchange-forward contracts. The net market value of these financial instruments combined is referred to below as the "net financial instrument position" and is disclosed in Note 14, *Fair Value Measurements*, to the consolidated financial statements. Our net financial instrument position increased from a liability of $3,239.1 at 30 September 2019 to a liability of $8,220.7 at 30 September 2020 due to the issuance of the $3.8 billion U.S. Dollar-denominated notes and €1.0 billion Eurobonds in the third quarter of fiscal year 2020. See Note 15, *Debt*, for additional information.

The analysis below presents the sensitivity of the market value of our financial instruments to selected changes in market rates and prices. Market values are the present values of projected future cash flows based on the market rates and prices chosen. The market values for interest rate risk and foreign currency risk are calculated by us using a third-party software model that utilizes standard pricing models to determine the present value of the instruments based on market conditions as of the valuation date, such as interest rates, spot and forward exchange rates, and implied volatilities.

Interest Rate Risk

Our debt portfolio as of 30 September 2020, including the effect of currency and interest rate swap agreements, was composed of 89% fixed-rate debt and 11% variable-rate debt. Our debt portfolio as of 30 September 2019, including the effect of currency and interest rate swap agreements, was composed of 74% fixed-rate debt and 26% variable-rate debt. The increase in fixed rate debt is the result of the U.S. Dollar- and Euro-denominated notes issued during the third quarter of fiscal year 2020.

The sensitivity analysis related to the interest rate risk on the fixed portion of our debt portfolio assumes an instantaneous 100 bp parallel move in interest rates from the level at 30 September 2020, with all other variables held constant. A 100 bp increase in market interest rates would result in a decrease of $711 and $75 in the net liability position of financial instruments at 30 September 2020 and 2019, respectively. A 100 bp decrease in market interest rates would result in an increase of $846 and $80 in the net liability position of financial instruments at 30

September 2020 and 2019, respectively. The longer maturities and increased principal associated with the U.S. Dollar- and Euro-denominated notes issued during the third quarter of fiscal year 2020 created a higher sensitivity to market interest rates.

Based on the variable-rate debt included in our debt portfolio, including the interest rate swap agreements, a 100 bp increase in interest rates would result in an additional $8 of interest incurred per year at 30 September 2020 and 2019. A 100 bp decline in interest rates would lower interest incurred by $8 per year at 30 September 2020 and 2019.

Foreign Currency Exchange Rate Risk

The sensitivity analysis related to foreign currency exchange rates assumes an instantaneous 10% change in the foreign currency exchange rates from their levels at 30 September 2020 and 2019, 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 $360 and $326 in the net liability position of financial instruments at 30 September 2020 and 2019, respectively.

The primary currency pairs for which we have exchange rate exposure are the Euro and U.S. Dollar and Chinese Renminbi and U.S. Dollar. Foreign currency debt, cross currency interest rate swaps, and foreign exchange-forward contracts are used in countries where we do business, thereby reducing our net asset exposure. Foreign exchange-forward contracts and cross currency interest rate swaps are also used to hedge our firm and highly anticipated foreign currency cash flows. Thus, there is either an asset or liability or cash flow exposure related to all of the financial instruments in the above sensitivity analysis for which the impact of a movement in exchange rates would be in the opposite direction and materially equal to the impact on the instruments in the analysis.

The majority of our sales are denominated in foreign currencies as they are derived outside the United States. Therefore, financial results will be affected by changes in foreign currency rates. The Chinese Renminbi and the Euro represent the largest exposures in terms of our foreign earnings. We estimate that a 10% reduction in either the Chinese Renminbi or the Euro versus the U.S. Dollar would lower our annual operating income by approximately $40 and $25, respectively.

COVID-19 Risks and Uncertainties

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

Item 8. Financial Statements and Supplementary Data.

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MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Air Products' management is responsible for establishing and maintaining adequate internal control over financial reporting. Our internal control over financial reporting, which is defined in the following sentences, is a process designed to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles and includes those policies and procedures that:

(i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company;

(ii) provide reasonable assurance that the transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and

(iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the financial statements.

Because of inherent limitations, internal control over financial reporting can only provide reasonable assurance and may not prevent or detect misstatements. Further, because of changes in conditions, the effectiveness of our internal control over financial reporting may vary over time. Our processes contain self-monitoring mechanisms, and actions are taken to correct deficiencies as they are identified.

Management has evaluated the effectiveness of its internal control over financial reporting based on criteria established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, management concluded that, as of 30 September 2020, the Company's internal control over financial reporting was effective.

Deloitte & Touche LLP, an independent registered public accounting firm, has issued its opinion on the Company's internal control over financial reporting as of 30 September 2020 as stated in its report which appears herein.

/s/ Seifi Ghasemi	/s/ M. Scott Crocco
Seifi Ghasemi	M. Scott Crocco
Chairman, President, and	Executive Vice President and
Chief Executive Officer	Chief Financial Officer
19 November 2020	19 November 2020

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of Air Products and Chemicals, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Air Products and Chemicals, Inc. and subsidiaries (the "Company") as of September 30, 2020 and 2019, the related consolidated income statements, comprehensive income statements, statements of equity, and statements of cash flows, for each of the two years in the period ended September 30, 2020, and the related notes (collectively referred to as the "financial statements"). We also have audited the Company's internal control over financial reporting as of September 30, 2020, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Company as of September 30, 2020 and 2019, and the results of its operations and its cash flows for each of the two years in the period ended September 30, 2020, in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of September 30, 2020, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

Basis for Opinions

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

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

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

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

Critical Audit Matter

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

Revenue – On-site Industrial Gas Customer Contracts – Refer to Notes 1 and 4 to the financial statements

Critical Audit Matter Description

On-site industrial gas customer contracts involve large capital investments to construct facilities and serve customers who require large volumes of gases and have relatively constant demand. The Company builds, owns and operates facilities on or near the customer's facilities to produce and supply the customer with gases under a long-term arrangement. Typically, these contracts have 15 to 20-year terms and contain fixed monthly charges and/or minimum purchase requirements. Revenue associated with these contracts is generally recognized over time during the period in which the Company delivers or makes available the agreed upon quantity of gases. In addition, certain on-site industrial gas contracts contain complex terms and provisions such as tolling arrangements, minimum payment requirements, pricing provisions, and variable components that are specific to a customer arrangement, including certain contracts with related parties. These arrangements may require greater judgment in determining when contractual requirements have been met, impacting the timing and amount of revenue to be recorded.

We identified revenue recognition for certain on-site industrial gas customer contracts with complex terms and provisions as a critical audit matter because of the judgments necessary for management to evaluate these contract terms, including amendments, when determining the amount of revenue to be recognized. This required a high degree of auditor judgment when performing procedures to audit management's identification and assessment of contract terms when determining the amount and timing of revenue recognition and evaluating the results of those procedures.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to revenue recognition for certain on-site industrial gas customer contracts with complex terms and provisions included the following procedures, among others:

- We tested the effectiveness of the Company's controls related to the amount and timing of revenue recognition, including controls over the evaluation of complex terms and provisions in certain on-site industrial gas customer contracts.
- We evaluated the terms included within original customer contracts and related amendments to assess the accounting for provisions such as minimum payment requirements, pricing provisions, settlement terms, and variable components that require management to apply judgment in determining revenue recognition associated with the contract.

- We tested the probability of collection of variable components, including penalties, which impacts the amount and timing of revenue which the Company expects to collect.
- We inquired of personnel who oversee operations, customer relations, and revenue recognition as to the presence of contract amendments, and interpretation of contract terms.
- We considered the nature of transactions with related parties and any potential impact on revenue recognition.
- We evaluated customer transactions and agreed the amount of revenue recognized to underlying contracts, customer invoices, and cash receipts.
- We considered customer payment history, subsequent events, write-offs of customer receivables, collectability, modification of contract terms, and other factors that could impact the amount and timing of revenue recognition.

/s/ Deloitte & Touche LLP
Philadelphia, Pennsylvania
November 19, 2020

We have served as the Company's auditor since 2018.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors of Air Products and Chemicals, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated statements of income, comprehensive income, cash flows and equity of Air Products and Chemicals, Inc. and Subsidiaries (the Company) for the year ended 30 September 2018, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the results of operations of the Company and its cash flows for the year ended 30 September 2018, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ KPMG LLP

We served as the Company's auditor from 2002 to 2018.

Philadelphia, Pennsylvania
November 20, 2018

Air Products and Chemicals, Inc. and Subsidiaries
CONSOLIDATED INCOME STATEMENTS

Year Ended 30 September (*Millions of dollars, except for share and per share data*)	**2020**	2019	2018
Sales	**$8,856.3**	$8,918.9	$8,930.2
Cost of sales	**5,858.1**	5,975.5	6,189.5
Facility closure	**—**	29.0	—
Selling and administrative	**775.9**	750.0	760.8
Research and development	**83.9**	72.9	64.5
Cost reduction actions	**—**	25.5	—
Gain on exchange of equity affiliate investments	**—**	29.1	—
Company headquarters relocation income (expense)	**33.8**	—	—
Other income (expense), net	**65.4**	49.3	50.2
Operating Income	**2,237.6**	2,144.4	1,965.6
Equity affiliates' income	**264.8**	215.4	174.8
Interest expense	**109.3**	137.0	130.5
Other non-operating income (expense), net	**30.7**	66.7	5.1
Income From Continuing Operations Before Taxes	**2,423.8**	2,289.5	2,015.0
Income tax provision	**478.4**	480.1	524.3
Income From Continuing Operations	**1,945.4**	1,809.4	1,490.7
(Loss) Income from discontinued operations, net of tax	**(14.3)**	—	42.2
Net Income	**1,931.1**	1,809.4	1,532.9
Net income attributable to noncontrolling interests of continuing operations	**44.4**	49.4	35.1
Net Income Attributable to Air Products	**$1,886.7**	$1,760.0	$1,497.8
Net Income Attributable to Air Products			
Net income from continuing operations	**$1,901.0**	$1,760.0	$1,455.6
Net (loss) income from discontinued operations	**(14.3)**	—	42.2
Net Income Attributable to Air Products	**$1,886.7**	$1,760.0	$1,497.8
Per Share Data*			
Basic EPS from continuing operations	**$8.59**	$7.99	$6.64
Basic EPS from discontinued operations	**(0.06)**	—	0.19
Basic EPS Attributable to Air Products	**$8.53**	$7.99	$6.83
Diluted EPS from continuing operations	**$8.55**	$7.94	$6.59
Diluted EPS from discontinued operations	**(0.06)**	—	0.19
Diluted EPS Attributable to Air Products	**$8.49**	$7.94	$6.78
Weighted Average Common Shares (in millions)			
Basic	**221.2**	220.3	219.3
Diluted	**222.3**	221.6	220.8

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

The accompanying notes are an integral part of these statements.

Air Products and Chemicals, Inc. and Subsidiaries
CONSOLIDATED COMPREHENSIVE INCOME STATEMENTS

Year ended 30 September *(Millions of dollars)*	**2020**	2019	2018
Net Income	**$1,931.1**	$1,809.4	$1,532.9
Other Comprehensive Income (Loss), net of tax:			
Translation adjustments, net of tax of ($29.4), $25.1, and $1.1	**233.4**	(356.2)	(244.6)
Net gain (loss) on derivatives, net of tax of $23.7, ($1.5), and $9.7	**43.5**	(44.1)	45.9
Pension and postretirement benefits, net of tax of ($15.6), ($97.9), and $55.2	**(68.2)**	(326.2)	179.4
Reclassification adjustments:			
Currency translation adjustment	**—**	(2.6)	3.1
Derivatives, net of tax of ($17.7), $4.5, and ($9.2)	**(57.7)**	12.3	(30.4)
Pension and postretirement benefits, net of tax of $27.1, $20.5, and $44.9	**82.5**	63.2	133.1
Total Other Comprehensive Income (Loss)	**233.5**	(653.6)	86.5
Comprehensive Income	**2,164.6**	1,155.8	1,619.4
Net Income Attributable to Noncontrolling Interests	**44.4**	49.4	35.1
Other Comprehensive Loss Attributable to Noncontrolling Interests	**(2.0)**	(19.9)	(19.0)
Comprehensive Income Attributable to Air Products	**$2,122.2**	$1,126.3	$1,603.3

The accompanying notes are an integral part of these statements.

Air Products and Chemicals, Inc. and Subsidiaries
CONSOLIDATED BALANCE SHEETS

30 September (*Millions of dollars, except for share and per share data*)	**2020**	2019
Assets		
Current Assets		
Cash and cash items	**$5,253.0**	$2,248.7
Short-term investments	**1,104.9**	166.0
Trade receivables, net	**1,274.8**	1,260.2
Inventories	**404.8**	388.3
Prepaid expenses	**164.5**	77.4
Other receivables and current assets	**482.9**	477.7
Total Current Assets	**8,684.9**	4,618.3
Investment in net assets of and advances to equity affiliates	**1,432.2**	1,276.2
Plant and equipment, net	**11,964.7**	10,337.6
Goodwill, net	**891.5**	797.1
Intangible assets, net	**435.8**	419.5
Noncurrent lease receivables	**816.3**	890.0
Other noncurrent assets	**943.1**	604.1
Total Noncurrent Assets	**16,483.6**	14,324.5
Total Assets	**$25,168.5**	$18,942.8
Liabilities and Equity		
Current Liabilities		
Payables and accrued liabilities	**$1,833.2**	$1,635.7
Accrued income taxes	**105.8**	86.6
Short-term borrowings	**7.7**	58.2
Current portion of long-term debt	**470.0**	40.4
Total Current Liabilities	**2,416.7**	1,820.9
Long-term debt	**7,132.9**	2,907.3
Long-term debt – related party	**297.2**	320.1
Other noncurrent liabilities	**1,916.0**	1,712.4
Deferred income taxes	**962.6**	793.8
Total Noncurrent Liabilities	**10,308.7**	5,733.6
Total Liabilities	**12,725.4**	7,554.5
Commitments and Contingencies - See Note 17		
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	**1,094.8**	1,070.9
Retained earnings	**14,875.7**	14,138.4
Accumulated other comprehensive loss	**(2,140.1)**	(2,375.6)
Treasury stock, at cost (2020 - 28,438,125 shares; 2019 - 29,040,322 shares)	**(2,000.0)**	(2,029.5)
Total Air Products Shareholders' Equity	**12,079.8**	11,053.6
Noncontrolling Interests	**363.3**	334.7
Total Equity	**12,443.1**	11,388.3
Total Liabilities and Equity	**$25,168.5**	$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

Year ended 30 September (*Millions of dollars*)	**2020**	2019	2018
Operating Activities			
Net income	**$1,931.1**	$1,809.4	$1,532.9
Less: Net income attributable to noncontrolling interests of continuing operations	**44.4**	49.4	35.1
Net income attributable to Air Products	**1,886.7**	1,760.0	1,497.8
Loss (Income) from discontinued operations	**14.3**	—	(42.2)
Income from continuing operations attributable to Air Products	**1,901.0**	1,760.0	1,455.6
Adjustments to reconcile income to cash provided by operating activities:			
Depreciation and amortization	**1,185.0**	1,082.8	970.7
Deferred income taxes	**165.0**	57.6	(55.4)
Tax reform repatriation	**—**	49.4	240.6
Facility closure	**—**	29.0	—
Undistributed (earnings) losses of unconsolidated affiliates	**(161.9)**	(75.8)	(59.8)
Gain on sale of assets and investments	**(45.8)**	(24.2)	(6.9)
Share-based compensation	**53.5**	41.2	38.8
Noncurrent lease receivables	**91.6**	94.6	97.4
Other adjustments	**116.4**	(19.4)	131.6
Working capital changes that provided (used) cash, excluding effects of acquisitions:			
Trade receivables	**43.2**	(69.0)	(42.8)
Inventories	**(5.2)**	(3.0)	(64.2)
Other receivables	**84.4**	79.8	128.3
Payables and accrued liabilities	**(31.9)**	(41.8)	(277.7)
Other working capital	**(130.6)**	8.7	(9.0)
Cash Provided by Operating Activities	**3,264.7**	2,969.9	2,547.2
Investing Activities			
Additions to plant and equipment, including long-term deposits	**(2,509.0)**	(1,989.7)	(1,568.4)
Acquisitions, less cash acquired	**(183.3)**	(123.2)	(345.4)
Investment in and advances to unconsolidated affiliates	**(24.4)**	(15.7)	—
Proceeds from sale of assets and investments	**80.3**	11.1	48.8
Purchases of investments	**(2,865.5)**	(172.1)	(530.3)
Proceeds from investments	**1,938.0**	190.5	748.2
Other investing activities	**3.9**	(14.3)	5.5
Cash Used for Investing Activities	**(3,560.0)**	(2,113.4)	(1,641.6)
Financing Activities			
Long-term debt proceeds	**4,895.8**	—	0.5
Payments on long-term debt	**(406.6)**	(428.6)	(418.7)
Net increase (decrease) in commercial paper and short-term borrowings	**(54.9)**	3.9	(78.5)
Dividends paid to shareholders	**(1,103.6)**	(994.0)	(897.8)
Proceeds from stock option exercises	**34.1**	68.1	76.2
Other financing activities	**(80.1)**	(19.9)	(41.5)
Cash Provided by (Used for) Financing Activities	**3,284.7**	(1,370.5)	(1,359.8)
Discontinued Operations			
Cash used for operating activities	**—**	—	(12.8)
Cash provided by investing activities	**—**	—	18.6
Cash provided by financing activities	**—**	—	—
Cash Provided by Discontinued Operations	**—**	—	5.8
Effect of Exchange Rate Changes on Cash	**14.9**	(28.6)	(33.9)
Increase (Decrease) in cash and cash items	**3,004.3**	(542.6)	(482.3)
Cash and Cash items – Beginning of Year	**2,248.7**	2,791.3	3,273.6
Cash and Cash Items – End of Period	**$5,253.0**	$2,248.7	$2,791.3

The accompanying notes are an integral part of these statements.

Air Products and Chemicals, Inc. and Subsidiaries
CONSOLIDATED STATEMENTS OF EQUITY

Year ended 30 September *(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 30 September 2017	**$249.4**	**$1,001.1**	**$12,846.6**	**($1,847.4)**	**($2,163.5)**	**$10,086.2**	**$99.3**	**$10,185.5**
Net income	—	—	1,497.8	—	—	1,497.8	35.1	1,532.9
Other comprehensive income (loss)	—	—	—	105.5	—	105.5	(19.0)	86.5
Dividends on common stock (per share $4.25)	—	—	(931.8)	—	—	(931.8)	—	(931.8)
Dividends to noncontrolling interests	—	—	—	—	—	—	(29.9)	(29.9)
Share-based compensation	—	38.1	—	—	—	38.1	—	38.1
Issuance of treasury shares for stock option and award plans	—	(11.3)	—	—	74.3	63.0	—	63.0
Lu'An joint venture	—	—	—	—	—	—	227.4	227.4
Other equity transactions	—	1.4	(2.7)	—	—	(1.3)	5.9	4.6
Balance 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	—	—	1,760.0	—	—	1,760.0	49.4	1,809.4
Other comprehensive income (loss)	—	—	—	(633.7)	—	(633.7)	(19.9)	(653.6)
Dividends on common stock (per share $4.58)	—	—	(1,008.3)	—	—	(1,008.3)	—	(1,008.3)
Dividends to noncontrolling interests	—	—	—	—	—	—	(12.2)	(12.2)
Share-based compensation	—	40.7	—	—	—	40.7	—	40.7
Issuance of treasury shares for stock option and award plans	—	2.2	—	—	59.7	61.9	—	61.9
Cumulative change in accounting principle	—	—	(17.1)	—	—	(17.1)	—	(17.1)
Other equity transactions	—	(1.3)	(6.1)	—	—	(7.4)	(1.4)	(8.8)
Balance 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	—	—	1,886.7	—	—	1,886.7	44.4	1,931.1
Other comprehensive income (loss)	—	—	—	235.5	—	235.5	(2.0)	233.5
Dividends on common stock (per share $5.18)	—	—	(1,144.1)	—	—	(1,144.1)	—	(1,144.1)
Dividends to noncontrolling interests	—	—	—	—	—	—	(31.8)	(31.8)
Share-based compensation	—	44.2	—	—	—	44.2	—	44.2
Issuance of treasury shares for stock option and award plans	—	(14.1)	—	—	29.5	15.4	—	15.4
Investments by noncontrolling interests	—	—	—	—	—	—	17.1	17.1
Other equity transactions	—	(6.2)	(5.3)	—	—	(11.5)	0.9	(10.6)
Balance 30 September 2020	**$249.4**	**$1,094.8**	**$14,875.7**	**($2,140.1)**	**($2,000.0)**	**$12,079.8**	**$363.3**	**$12,443.1**

The accompanying notes are an integral part of these statements.

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

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

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1. MAJOR ACCOUNTING POLICIES

Basis of Presentation and Consolidation Principles

The accompanying consolidated financial statements of Air Products and Chemicals, Inc. were prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”) and include the accounts of Air Products and Chemicals, Inc. and those of its controlled subsidiaries (“we,” “our,” “us,” the “Company,” “Air Products,” or “registrant”), which are generally majority owned. Intercompany transactions and balances are eliminated in consolidation.

We consolidate all entities that we control. The general condition for control is ownership of a majority of the voting interests of an entity. Control may also exist in arrangements where we are the primary beneficiary of a variable interest entity ("VIE"). An entity that has both the power to direct the activities that most significantly impact the economic performance of a VIE and the obligation to absorb losses or receive benefits significant to the VIE is considered the primary beneficiary of that entity. We have determined that we are not a primary beneficiary of any material VIE.

The results of operations and cash flows for our discontinued operations have been segregated from the results of continuing operations and segment results. The comprehensive income related to discontinued operations has not been segregated and is included in the consolidated comprehensive income statements. There were no assets and liabilities presented as discontinued operations on the consolidated balance sheets. Refer to Note 6, *Discontinued Operations*, for additional information.

The notes to the consolidated financial statements, unless otherwise indicated, are on a continuing operations basis. The term "total company" includes both continuing and discontinued operations.

Certain prior year information has been reclassified to conform to the fiscal year 2020 presentation.

Estimates and Assumptions

The preparation of the financial statements in conformity with GAAP requires management to make estimates and assumptions that affect amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates.

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. COVID-19 had a negative impact on our operating results in fiscal year 2020, primarily in the regional industrial gas segments. We continue to monitor its impact on our operations; however, we are unable to predict the future impact that COVID-19 will have on our future financial position and operating results due to numerous uncertainties, including the duration and severity of the outbreak.

Revenue Recognition

We recognize revenue when or as performance obligations are satisfied, which occurs when control is transferred to the customer.

We determine the transaction price of our contracts based on the amount of consideration to which we expect to be entitled to receive in exchange for the goods or services provided. Our contracts within the scope of revenue guidance do not contain payment terms that include a significant financing component.

Sales returns and allowances are not a business practice in the industry.

Our sale of gas contracts are either accounted for over time during the period in which we deliver or make available the agreed upon quantity of goods or at a point in time when the customer receives and obtains control of the product, which generally occurs upon delivery. We generally recognize revenue from our sale of gas contracts based on the right to invoice practical expedient.

Our sale of equipment contracts are generally comprised of a single performance obligation as the individual promised goods or services contained within the contracts are integrated with or dependent upon other goods or services in the contract for a single output to the customer. Revenue from our sale of equipment contracts is generally recognized over time as we have an enforceable right to payment for performance completed to date and our performance under the contract terms does not create an asset with alternative use. We recognize these contracts using a cost incurred input method by which costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations.

Amounts billed for shipping and handling fees are classified as sales in the consolidated income statements. Shipping and handling activities for our sale of equipment contracts may be performed after the customer obtains control of the promised goods. In these cases, we have elected to apply the practical expedient to account for shipping and handling as activities to fulfill the promise to transfer the goods. For our sale of gas contracts, control generally transfers to the customer upon delivery.

Amounts billed for sales and use taxes, value-added taxes, and certain excise and other specific transactional taxes imposed on revenue-producing transactions are presented on a net basis and excluded from sales in the consolidated income statements.

For additional information, refer to Note 4, *Revenue Recognition*.

Cost of Sales

Cost of sales predominantly represents the cost of tangible products sold. These costs include labor, raw materials, plant engineering, power, depreciation, production supplies and materials packaging costs, and maintenance costs. Costs incurred for shipping and handling are also included in cost of sales.

Depreciation

Depreciation is recorded using the straight-line method, which deducts equal amounts of the cost of each asset from earnings every year over its expected economic useful life. The principal lives for major classes of plant and equipment are summarized in Note 9, *Plant and Equipment, net*.

Selling and Administrative

The principal components of selling and administrative expenses are compensation, advertising, and promotional costs.

Postemployment Benefits

We provide termination benefits to employees as part of ongoing benefit arrangements and record a liability for termination benefits when probable and estimable. These criteria are met when management, with the appropriate level of authority, approves and commits to its plan of action for termination; the plan identifies the employees to be terminated and their related benefits; and the plan is to be completed within one year. We do not provide material one-time benefit arrangements.

Fair Value Measurements

We are required to measure certain assets and liabilities at fair value, either upon initial measurement or for subsequent accounting or reporting. For example, fair value is used in the initial measurement of assets and liabilities acquired in a business combination; on a recurring basis in the measurement of derivative financial instruments; and on a nonrecurring basis when long-lived assets are written down to fair value when held for sale or determined to be impaired. Refer to Note 14, *Fair Value Measurements*, and Note 16, *Retirement Benefits*, for information on the methods and assumptions used in our fair value measurements.

Financial Instruments

We address certain financial exposures through a controlled program of risk management that includes the use of derivative financial instruments. The types of derivative financial instruments permitted for such risk management programs are specified in policies set by management. Refer to Note 13, *Financial Instruments*, for further detail on the types and use of derivative instruments into which we enter.

Major financial institutions are counterparties to all of these derivative contracts. We have established counterparty credit guidelines and generally enter into transactions with financial institutions of investment grade or better. Management believes the risk of incurring losses related to credit risk is remote, and any losses would be immaterial to the consolidated financial results, financial condition, or liquidity.

We recognize derivatives on the balance sheet at fair value. On the date the derivative instrument is entered into, we generally designate the derivative as either (1) a hedge of a forecasted transaction or of the variability of cash flows to be received or paid related to a recognized asset or liability (cash flow hedge), (2) a hedge of a net investment in a foreign operation (net investment hedge), or (3) a hedge of the fair value of a recognized asset or liability (fair value hedge).

The following details the accounting treatment of our cash flow, fair value, net investment, and non-designated hedges:

- Changes in the fair value of a derivative that is designated as and meets the cash flow hedge criteria are recorded in accumulated other comprehensive loss ("AOCL") to the extent effective and then recognized in earnings when the hedged items affect earnings.
- Changes in the fair value of a derivative that is designated as and meets all the required criteria for a fair value hedge, along with the gain or loss on the hedged asset or liability that is attributable to the hedged risk, are recorded in current period earnings.
- Changes in the fair value of a derivative and foreign currency debt that are designated as and meet all the required criteria for a hedge of a net investment are recorded as translation adjustments in AOCL.
- Changes in the fair value of a derivative that is not designated as a hedge are recorded immediately in earnings.

We formally document the relationships between hedging instruments and hedged items, as well as our risk management objective and strategy for undertaking various hedge transactions. This process includes relating derivatives that are designated as fair value or cash flow hedges to specific assets and liabilities on the balance sheet or to specific firm commitments or forecasted transactions. We also formally assess, at the inception of the hedge and on an ongoing basis, whether derivatives are highly effective in offsetting changes in fair values or cash flows of the hedged item. If it is determined that a derivative is not highly effective as a hedge, or if a derivative ceases to be a highly effective hedge, we will discontinue hedge accounting with respect to that derivative prospectively.

Foreign Currency

Since we do business in many foreign countries, fluctuations in currency exchange rates affect our financial position and results of operations.

In most of our foreign operations, the local currency is considered the functional currency. Foreign subsidiaries translate their assets and liabilities into U.S. dollars at current exchange rates in effect as of the balance sheet date. The gains or losses that result from this process are shown as translation adjustments in AOCL in the equity section of the balance sheet.

The revenue and expense accounts of foreign subsidiaries are translated into U.S. dollars at the average exchange rates that prevail during the period. Therefore, the U.S. dollar value of these items on the consolidated income statements fluctuates from period to period, depending on the value of the U.S. dollar against foreign currencies. Some transactions are made in currencies different from an entity’s functional currency. Gains and losses from these foreign currency transactions are generally reflected in "Other income (expense), net" on our consolidated income statements as they occur. Net foreign exchange losses reflected in "Other income (expense), net" were not material for the periods presented. Refer to the *Other Non-Operating Income (Expense), Net* section below for discussion on other foreign currency presentation.

Environmental Expenditures

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. Remediation costs are capitalized if the costs improve our property as compared with the condition of the property when originally constructed or acquired, or if the costs prevent environmental contamination from future operations. We expense environmental costs related to existing conditions resulting from past or current operations and from which no current or future benefit is discernible. The amounts charged to income from continuing operations related to environmental matters totaled $18.3, $14.2, and $12.8 in fiscal years 2020, 2019, and 2018, respectively. In addition, we recorded a pre-tax expense of $19.0 in results from discontinued operations to increase our environmental accrual for the Pace facility in the second quarter of fiscal year 2020. Refer to the Pace discussion within Note 17, *Commitments and Contingencies*, for additional information.

The measurement of environmental liabilities is based on an evaluation of currently available information with respect to each individual site and considers factors such as existing technology, presently enacted laws and regulations, and prior experience in remediation of contaminated sites. An environmental liability related to cleanup of a contaminated site might include, for example, a provision for one or more of the following types of costs: site investigation and testing costs, remediation costs, post-remediation monitoring costs, natural resource damages, and outside legal fees. These liabilities include costs related to other potentially responsible parties to the extent that we have reason to believe such parties will not fully pay their proportionate share. They do not consider any claims for recoveries from insurance or other parties and are not discounted.

As assessments and remediation progress at individual sites, the amount of projected cost is reviewed and the liability is adjusted to reflect additional technical and legal information that becomes available. Management has an established process in place to identify and monitor our environmental exposures. An environmental accrual analysis is prepared and maintained that lists all environmental loss contingencies, even where an accrual has not been established. This analysis assists in monitoring our overall environmental exposure and serves as a tool to facilitate ongoing communication among our technical experts, environmental managers, environmental lawyers, and financial management to ensure that required accruals are recorded and potential exposures disclosed.

Given inherent uncertainties in evaluating environmental exposures, actual costs to be incurred at identified sites in future periods may vary from the estimates. Refer to Note 17, *Commitments and Contingencies*, for additional information on our environmental loss contingencies.

The accruals for environmental liabilities are reflected in the consolidated balance sheets, primarily as part of other noncurrent liabilities.

Litigation

In the normal course of business, we are involved in legal proceedings. We accrue a liability for such matters when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. When only a range of possible loss can be established, the most probable amount in the range is accrued. If no amount within this range is a better estimate than any other amount within the range, the minimum amount in the range is accrued. The accrual for a litigation loss contingency includes estimates of potential damages and other directly related costs expected to be incurred. Refer to Note 17, *Commitments and Contingencies*, for additional information on our current legal proceedings.

Share-Based Compensation

We have various share-based compensation programs, which include deferred stock units, stock options, and restricted stock. We expense the grant-date fair value of these awards over the vesting period during which employees perform related services. Expense recognition is accelerated for retirement-eligible individuals who would meet the requirements for vesting of awards upon their retirement. Refer to Note 19, *Share-Based Compensation*, for additional information regarding these awards and the models and assumptions used to determine the grant-date fair value of our awards.

Income Taxes

We account for income taxes under the asset and liability method. Under this method, deferred tax assets and liabilities are recognized for the tax effects of temporary differences between the financial reporting and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to be recovered or settled. A principal temporary difference results from the excess of tax depreciation over book depreciation because accelerated methods of depreciation and shorter useful lives are used for income tax purposes. The cumulative impact of a change in tax rates or regulations is included in income tax expense in the period that includes the enactment date. We recognize deferred tax assets net of existing valuation allowances to the extent we believe that these assets are more likely than not to be realized considering all available evidence.

A tax benefit for an uncertain tax position is recognized when it is more likely than not that the position will be sustained upon examination based on its technical merits. This position is measured as the largest amount of tax benefit that is greater than 50% likely of being realized. Interest and penalties related to unrecognized tax benefits are recognized as a component of income tax expense. For additional information regarding our income taxes, refer to Note 22, *Income Taxes*.

Other Non-Operating Income (Expense), net

Other non-operating income (expense), net includes interest income associated with our cash and cash items and short-term investments, certain impacts from hedging activities, and non-service cost components of net periodic pension and postretirement benefit cost. Our non-service costs primarily include interest cost, expected return on plan assets, amortization of actuarial gains and losses, and settlements.

In fiscal year 2020, we adopted new accounting guidance on hedging activities 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 amortized on a straight-line basis within “Other non-operating income (expense), net." 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 also reflected within “Other non-operating income (expense), net.” Refer to Note 2, *New Accounting Guidance*, for additional information.

Cash and Cash Items

Cash and cash items include cash, time deposits, and treasury securities acquired with an original maturity of three months or less.

Short-term Investments

Short-term investments include time deposits and treasury securities with original maturities greater than three months and less than one year.

Trade Receivables, net

Trade receivables comprise amounts owed to us through our operating activities and are presented net of allowances for doubtful accounts. The allowances for doubtful accounts represent estimated uncollectible receivables associated with potential customer defaults on contractual obligations. A provision for customer defaults is made on a general formula basis when it is determined that the risk of some default is probable and estimable but cannot yet be associated with specific customers. The assessment of the likelihood of customer defaults is based on various factors, including the length of time the receivables are past due, historical experience, and existing economic conditions. The allowance also includes amounts for certain customers where a risk of default has been specifically identified, considering factors such as the financial condition of the customer and their inability to pay. The allowance excludes amounts associated with customer disputes over contractual terms and conditions. Changes to the carrying amount of the allowance for doubtful accounts are summarized below:

Balance at 30 September 2017	$22.6
Provision for credit losses	11.2
Write-offs charged against the allowance	(7.2)
Currency translation and other	(0.2)
Balance at 30 September 2018	$26.4
Provision for credit losses	7.7
Write-offs charged against the allowance	(6.8)
Currency translation and other	(2.5)
Balance at 30 September 2019	$24.8
Provision for credit losses	7.7
Write-offs charged against the allowance	(8.3)
Currency translation and other	(0.3)
Balance at 30 September 2020	**$23.9**

Inventories

We carry inventory that is comprised of finished goods, work-in-process, raw materials and supplies. Refer to Note 7, *Inventories*, for further detail.

Inventories on our consolidated balance sheets are stated at the lower of cost or net realizable value. We write down our inventories for estimated obsolescence or unmarketable inventory based upon assumptions about future demand and market conditions.

Effective 1 July 2018, we determine the cost of all our inventories on a first-in, first-out basis ("FIFO"). Prior to 1 July 2018, we determined the cost of our industrial gas inventories in the United States on a last-in, first-out basis ("LIFO"). We applied this accounting change as a cumulative effect adjustment to cost of sales in the fourth quarter of fiscal year 2018. This change decreased our cost of sales by $24.1 for the quarter and fiscal year ended 30 September 2018.

Equity Investments

The equity method of accounting is used when we exercise significant influence but do not have operating control, generally assumed to be 20% – 50% ownership. Under the equity method, original investments are recorded at cost and adjusted by our share of undistributed earnings or losses of these companies. We use the cumulative earnings approach for determining cash flow presentation of cash distributions received from equity method investees. Equity investments are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the investment may not be recoverable.

Plant and Equipment, net

Plant and equipment, net is stated at cost less accumulated depreciation. Construction costs, labor, and applicable overhead related to installations are capitalized. Expenditures for additions and improvements that extend the lives or increase the capacity of plant assets are capitalized. The costs of maintenance and repairs of plant and equipment are charged to expense as incurred.

Fully depreciated assets are retained in the gross plant and equipment and accumulated depreciation accounts until they are removed from service. In the case of disposals, assets and related depreciation are removed from the accounts, and the net amounts, less proceeds from disposal, are included in income. Refer to Note 9, *Plant and Equipment, net*, for further detail.

Computer Software

We capitalize costs incurred to purchase or develop software for internal use. Capitalized costs include purchased computer software packages, payments to vendors/consultants for development and implementation or modification to a purchased package to meet our requirements, payroll and related costs for employees directly involved in development, and interest incurred while software is being developed. Capitalized computer software costs are reflected in "Plant and equipment, net" on the consolidated balance sheets and are depreciated over the estimated useful life of the software, generally a period of three to five years.

Capitalized Interest

As we build new plant and equipment, we include in the cost of these assets a portion of the interest payments we make during the year. The amount of capitalized interest was $15.9, $13.5, and $19.5 in fiscal years 2020, 2019, and 2018, respectively.

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.

Impairment of Long-Lived Assets

Long-lived assets are grouped for impairment testing at the lowest level for which there are identifiable cash flows that are largely independent of the cash flows of other assets and liabilities and are evaluated for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset group may not be recoverable. We assess recoverability by comparing the carrying amount of the asset group to estimated undiscounted future cash flows expected to be generated by the asset group. If an asset group is considered impaired, the impairment loss to be recognized is measured as the amount by which the asset group’s carrying amount exceeds its fair value. Long-lived assets meeting the held for sale criteria are reported at the lower of carrying amount or fair value less cost to sell.

Asset Retirement Obligations

The fair value of a liability for an asset retirement obligation is recognized in the period in which it is incurred. The fair value of the liability is measured using discounted estimated cash flows and is adjusted to its present value in subsequent periods as accretion expense is recorded. The corresponding asset retirement costs are capitalized as part of the carrying amount of the related long-lived asset and depreciated over the asset's useful life. Our asset retirement obligations are primarily associated with on-site long-term supply contracts under which we have built a facility on land owned by the customer and are obligated to remove the facility at the end of the contract term. Our asset retirement obligations totaled $241.4 and $208.2 at 30 September 2020 and 2019, respectively.

Goodwill

Business combinations are accounted for using the acquisition method. The purchase price is allocated to the assets acquired and liabilities assumed based on their estimated fair values. Any excess purchase price (plus the fair value of any noncontrolling interest and previously held equity interest in the acquiree) over the fair market value of the net assets acquired, including identified intangibles, is recorded as goodwill. Preliminary purchase price allocations are made at the date of acquisition and finalized when information about facts and circumstances that existed as of the acquisition date needed to finalize underlying estimates is obtained or when we determine that such information is not obtainable, within a maximum measurement period of one year.

Goodwill is subject to impairment testing at least annually. In addition, goodwill is tested more frequently if a change in circumstances or the occurrence of events indicates that potential impairment exists. Refer to Note 10, *Goodwill*, for further detail.

Intangible Assets

Intangible assets with determinable lives primarily consist of customer relationships, purchased patents and technology, and land use rights. The cost of intangible assets with determinable lives is amortized on a straight-line basis over the estimated period of economic benefit. No residual value is estimated for these intangible assets. Indefinite-lived intangible assets consist of trade names and trademarks. Indefinite-lived intangibles are subject to impairment testing at least annually. In addition, intangible assets are tested more frequently if a change in circumstances or the occurrence of events indicates that potential impairment exists.

Customer relationships are generally amortized over periods of five to twenty-five years. Purchased patents and technology and other finite-lived intangibles are generally amortized over periods of five to fifteen years. Other intangibles includes land use rights, which are generally amortized over a period of fifty years. Amortizable lives are adjusted whenever there is a change in the estimated period of economic benefit. Refer to Note 11, *Intangible Assets*, for further detail.

Retirement Benefits

The cost of pension benefits is generally recognized over the employees' service period. We use actuarial methods and assumptions in the valuation of defined benefit obligations and the determination of expense. Differences between actual and expected results or changes in the value of obligations and plan assets are not recognized in earnings as they occur but, rather, are recognized systematically over subsequent periods. Refer to Note 16, *Retirement Benefits*, for disclosures related to our pension and other postretirement benefits.

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.

We are 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 as of the adoption date of $375.3 and $332.3, respectively. The standard did not materially affect our retained earnings, results of operations or liquidity. Refer to Note 12, *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." In fiscal year 2020, excluded components of $33.5 were recognized in "Other non-operating income (expense), net" consistent with the remeasurement of the intercompany loans. Interest expense of $33.3 and $42.6 in fiscal years 2019 and 2018, respectively, has not been restated to conform to the 2020 presentation.

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.

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 adopted this guidance in the fourth quarter of fiscal year 2020 and updated the disclosures contained in Note 16, *Retirement Benefits*, accordingly. Other than the modification of certain disclosures, this guidance had no effect on our 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. We will adopt this guidance at the beginning of fiscal year 2021 under the modified retrospective approach with an adjustment to retained earnings as of the effective date. This guidance will not have a material impact on our consolidated financial statements upon adoption.

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. We will adopt this guidance at the beginning of fiscal year 2021. This guidance will not have a material impact on our consolidated financial statements upon adoption.

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. We will adopt this guidance at the beginning of fiscal year 2021. This guidance will not 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 exceptions for applying 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. To date, we have had no impacts on our hedging relationships related to reference rate reform. We will continue to evaluate the impact this guidance could have on our consolidated financial statements.

3. ACQUISITIONS

Fiscal Year 2020

Asset Acquisition

On 17 April 2020, we acquired five operating hydrogen production plants from PBF Energy Inc. ("PBF") and commenced contractual long-term supply of hydrogen from those plants to PBF's refineries. We accounted for the transaction as an asset acquisition and recorded the aggregate purchase price of approximately $580 to plant and equipment on our consolidated balance sheets.

Business Combinations

We completed three acquisitions on 1 July 2020 that were accounted for as business combinations. These acquisitions had an aggregate purchase price, net of cash acquired, of $185.4. The largest of these acquisitions was the purchase of Oxygen & Argon Works Ltd., the leading manufacturer and marketer of industrial gases in Israel, primarily offering merchant gas products. We expect this acquisition to create growth opportunities in the region and allow us to leverage synergies and operating efficiencies. The results of this business are consolidated within our Industrial Gases – EMEA segment and did not materially impact our consolidated income statement.

Our fiscal year 2020 business combinations resulted in the recognition of plant and equipment of $71.2, goodwill of $71.1, and intangible assets of $50.7, partially offset by net liabilities acquired. The goodwill recognized on the transactions, $8.1 of which is deductible for tax purposes, is attributable to expected growth and cost synergies. The intangible assets recognized primarily resulted from acquired customer relationships, having a weighted-average useful life of 19 years.

The acquired assets and liabilities resulting from our 2020 business combinations were recorded at their estimated fair values, which were calculated based primarily on a preliminary purchase price allocation prepared by independent valuation specialists. We may record adjustments to these assets and liabilities during the preliminary purchase price allocation period, which could be up to one year from the acquisition date.

Fiscal Year 2019

As further discussed below, we completed three business combinations in fiscal year 2019.

Exchange of Equity Affiliate Investments

We previously held 50% ownership interests in High-Tech Gases (Beijing) Co., Ltd. ("High-Tech Gases") and WuXi Hi-Tech Gas Co., Ltd. ("WuXi"), both of which were joint ventures with another industrial gas company in China. We accounted for these arrangements as equity method investments in our Industrial Gases – Asia segment through 30 April 2019.

On 1 May 2019, we acquired our partner's 50% interest in WuXi in exchange for our 50% interest in High-Tech Gases. The exchange resulted in a net gain of $29.1, of which $15.0 resulted from the revaluation of our previously held equity interest in WuXi to its acquisition date fair value and $14.1 resulted from the disposition of our interest in High-Tech Gases. The net gain was reflected as "Gain on exchange of equity affiliate investments" on our consolidated income statements in fiscal year 2019 and was excluded from the results of the Industrial Gases – Asia segment.

We revalued our previously held 50% equity interest in WuXi based on an estimated acquisition date fair value of $27.0. We calculated this fair value using a discounted cash flow analysis under the income approach, which required estimates and assumptions regarding projected revenue growth, customer attrition rates, profit margin, and discount rate.

The acquisition of the remaining interest in WuXi was accounted for as a business combination. The results of this business are consolidated within our Industrial Gases – Asia segment.

Other Fiscal Year 2019 Business Combinations

The remaining business combinations completed in fiscal year 2019 had total consideration, net of cash acquired, of $126.6. The largest of these business combinations was the acquisition of ACP Europe SA ("ACP"), the largest independent carbon dioxide business in Continental Europe, which closed in the second quarter. The results of this business are consolidated within our Industrial Gases – EMEA segment.

Fiscal Year 2018

Asset Acquisition

On 26 April 2018 ("the acquisition date"), we completed the formation of Air Products Lu An (Changzhi) Co., Ltd. (the “JV”), a 60%-owned joint venture with Lu’An Clean Energy Company ("Lu’An"). The results of the JV are consolidated within the Industrial Gases – Asia segment.

Air Products contributed four large air separation units to the JV, and the JV acquired gasification and syngas clean-up assets from Lu’An. We accounted for the acquisition of the gasification and syngas clean-up assets as an asset acquisition. In connection with closing the acquisition, we paid net cash of approximately 1.5 billion RMB ($235) and issued equity of 1.4 billion RMB ($227) to Lu'An for their noncontrolling interest in the JV. In addition, Lu'An made a loan of 2.6 billion RMB to the JV, and we established a liability for remaining cash payments. The issuance of equity to Lu'An for their noncontrolling interest, the long-term debt, and the liability for the remaining cash payments were noncash transactions that were excluded from the consolidated statement of cash flows for the fiscal year ended 30 September 2018. Refer to Note 15, *Debt*, for additional information on our related party debt.

Business Combinations

We completed eight acquisitions that were accounted for as business combinations in fiscal year 2018. These acquisitions had total consideration, net of cash acquired, of $355.4. The largest of the acquisitions was completed during the first quarter of fiscal year 2018 and primarily consisted of three air separation units serving onsite and merchant customers in China. The results of this business are consolidated within our Industrial Gases – Asia segment.

4. REVENUE RECOGNITION

Nature of Goods and Services

The principal activities from which we generate sales from our contracts with customers, separated between our regional industrial gases businesses and industrial gases equipment businesses, are described below with their respective revenue recognition policies. For an overall summary of these policies and discussion on payment terms and presentation, refer to Note 1, *Major Accounting Policies*.

Industrial Gases – Regional

Our regional industrial gases businesses produce and sell atmospheric gases such as oxygen, nitrogen, and argon (primarily recovered by the cryogenic distillation of air) and process gases such as hydrogen, helium, carbon dioxide, carbon monoxide, syngas, and specialty gases. We distribute gases to our sale of gas customers through different supply modes depending on various factors including the customer's volume requirements and location. Our supply modes are as follows:

- *On-site Gases*—Supply mode associated with customers who require large volumes of gases and have relatively constant demand. Gases are produced and supplied by large facilities we construct on or near the customers' facilities or by pipeline systems from centrally located production facilities. These sale of gas contracts generally have 15- to 20- year terms. We also deliver smaller quantities of product through small on-site plants (cryogenic or non-cryogenic generators), typically via 10- to 15- year sale of gas contracts. The contracts within this supply mode generally contain fixed monthly charges and/or minimum purchase requirements with price escalation provisions that are generally based on external indices. Revenue associated with this supply mode is generally recognized over time during the period in which we deliver or make available the agreed upon quantity of goods.

- *Merchant Gases*—Supply mode associated with liquid bulk and packaged gases customers. Liquid bulk customers receive delivery of product in liquid or gaseous form by tanker or tube trailer. The product is stored, usually in its liquid state, in equipment we typically design and install at the customer's site for vaporizing into a gaseous state as needed. Packaged gases customers receive small quantities of product delivered in either cylinders or dewars. Both liquid bulk and packaged gases sales do not contain minimum purchase requirements as they are governed by contracts and/or purchase orders based on the customer's requirements. These contracts contain stated terms that are generally 5 years or less. Performance obligations associated with this supply mode are satisfied at a point in time when the customer receives and obtains control of the product, which generally occurs upon delivery.

The timing of revenue recognition for our regional industrial gases businesses is generally consistent with our right to invoice the customer. Variable components of consideration that may not be resolved within the month, such as the ability to earn an annual bonus or incur a penalty, are more relevant to on-site contracts and are considered constrained as they can be impacted by a single significant event such as a plant outage, which could occur at the end of a contract period. We consider contract modifications on an individual basis to determine appropriate accounting treatment. However, contract modifications are generally accounted for prospectively as they relate to distinct goods or services associated with future periods of performance.

We mitigate energy and natural gas price risk contractually through pricing formulas, surcharges, and cost pass-through arrangements.

Industrial Gases – Equipment

We design and manufacture equipment for air separation, hydrocarbon recovery and purification, natural gas liquefaction, and liquid helium and liquid hydrogen transport and storage. The Industrial Gases – Global and the Corporate and other segments serve our sale of equipment customers.

Our sale of equipment contracts are generally comprised of a single performance obligation as the individual promised goods or services contained within the contracts are integrated with or dependent upon other goods or services in the contract for a single output to the customer.

Revenue from our sale of equipment contracts is generally recognized over time as we have an enforceable right to payment for performance completed to date and our performance under the contract terms does not create an asset with alternative use. Otherwise, sale of equipment contracts are satisfied at the point in time the customer obtains control of the equipment, which is generally determined based on the shipping terms of the contract. For contracts recognized over time, we primarily recognize revenue using a cost incurred input method by which costs incurred to date relative to total estimated costs at completion are used to measure progress toward satisfying performance obligations. Costs incurred include material, labor, and overhead costs and represent work contributing and proportionate to the transfer of control to the customer.

Since our contracts are generally comprised of a single performance obligation, contract modifications are typically accounted for as part of the existing contract and are recognized as a cumulative adjustment for the inception-to-date effect of such change. In addition, changes in estimates on projects accounted for under the cost incurred input method are recognized as a cumulative adjustment for the inception-to-date effect of such change. Changes in estimates favorably impacted operating income by approximately $7, $37, and $38 in fiscal years 2020, 2019, and 2018, respectively. Our changes in estimates would not have significantly impacted amounts recorded in prior years.

Disaggregation of Revenue

The table below presents our consolidated sales for fiscal years 2020 and 2019 disaggregated by supply mode for each of our reporting segments. 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	%
2020							
On-site	$2,040.2	$629.3	$1,652.8	$—	$—	$4,322.3	49 %
Merchant	1,590.5	1,297.0	1,063.7	—	—	3,951.2	45 %
Sale of Equipment	—	—	—	364.9	217.9	582.8	6 %
Total	**$3,630.7**	**$1,926.3**	**$2,716.5**	**$364.9**	**$217.9**	**$8,856.3**	**100 %**
2019							
On-site	$2,230.6	$728.4	$1,622.6	$—	$—	$4,581.6	52 %
Merchant	1,642.9	1,274.1	1,041.0	—	—	3,958.0	44 %
Sale of Equipment	—	—	—	261.0	118.3	379.3	4 %
Total	**$3,873.5**	**$2,002.5**	**$2,663.6**	**$261.0**	**$118.3**	**$8,918.9**	**100 %**

Remaining Performance Obligations

As of 30 September 2020, the transaction price allocated to remaining performance obligations is estimated to be approximately $22 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.

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:

30 September	Balance Sheet Location	**2020**	2019
Assets			
Contract assets – current	Other receivables and current assets	**$55.9**	$64.3
Contract fulfillment costs – current	Other receivables and current assets	**109.9**	64.5
Liabilities			
Contract liabilities – current	Payables and accrued liabilities	**313.8**	247.4
Contract liabilities – noncurrent	Other noncurrent liabilities	**57.9**	49.2

Contract assets and liabilities result from differences in timing of revenue recognition and customer invoicing. These balances are reported on the consolidated balance sheets on a contract-by-contract basis at the end of each reporting period.

Contract assets primarily relate to our sale of equipment contracts for which revenue is recognized over time. These balances represent unbilled revenue, which occurs when revenue recognized under the measure of progress exceeds the amount invoiced to our customers. Our ability to invoice the customer for contract asset balances is not only based on the passage of time, but also the achievement of certain contractual milestones.

Contract fulfillment costs primarily include deferred costs related to sale of equipment projects that cannot be inventoried and for which we expect to recognize revenue upon transfer of control at project completion or costs related to fulfilling a specific anticipated contract.

Costs to obtain a contract, or contract acquisition costs, are capitalized only after we have established a contract with the customer. We elected to apply the practical expedient to expense these costs as they are incurred if the amortization period of the asset that would have otherwise been recognized is one year or less. Our contract acquisition costs capitalized as of 30 September 2020 and 2019 were not material.

Contract liabilities include advance payments or right to consideration prior to performance under the contract. Contract liabilities are recognized as revenue when or as we perform under the contract. The increase in our contract liabilities – current balance primarily relates to new sale of equipment projects as balances associated with our sale of gas contracts are generally related to fixed charges and are relatively consistent period over period. During the fiscal year ended 30 September 2020, we recognized approximately $145 in revenue associated with sale of equipment contracts that was included within our contract liabilities as of 30 September 2019. Advanced payments from our customers do not represent a significant financing component as these payments are intended for purposes other than financing, such as to meet working capital demands or to protect us from our customer failing to meet its obligations under the terms of the contract.

Changes in contract asset and liability balances during the fiscal year ended 30 September 2020 were not materially impacted by any other factors.

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 30 September 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	(13.5)
Currency translation adjustment	0.4
30 September 2020	**$4.7**

6. DISCONTINUED OPERATIONS

In fiscal year 2020, loss from discontinued operations, net of tax, was $14.3. This resulted from a pre-tax loss of $19.0 recorded in the second quarter 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 17, *Commitments and Contingencies*, for additional information. The loss did not have an impact on our cash flows for the fiscal year ended 30 September 2020.

In fiscal year 2018, income from discontinued operations, net of tax, was $42.2. This included an income tax benefit of $25.6 resulting from the resolution of uncertain tax positions taken in conjunction with the disposition of our former European Homecare business in fiscal year 2012 and an after-tax benefit of $17.6 resulting from the resolution of certain post-closing adjustments associated with the sale of our former Performance Materials Division in fiscal year 2017. These benefits were partially offset by an after-tax loss of $1.0 associated with Energy-from-Waste project exit activities.

7. INVENTORIES

The components of inventories are as follows:

30 September	**2020**	2019
Finished goods	**$134.5**	$128.8
Work in process	**21.3**	27.5
Raw materials, supplies and other	**249.0**	232.0
Inventories	**$404.8**	$388.3

8. SUMMARIZED FINANCIAL INFORMATION OF EQUITY AFFILIATES

The summarized financial information below is on a combined 100% basis and has been compiled based on financial statements of the companies accounted for by the equity method. The amounts presented include the accounts of the following equity affiliates:

Abdullah Hashim Industrial Gases & Equipment Co., Ltd. (25%);
Air Products South Africa (Proprietary) Limited (50%);
Bangkok Cogeneration Company Limited (49%);
Bangkok Industrial Gases Co., Ltd. (49%);
Chengdu Air & Gas Products Ltd. (50%);
Helios S.p.A. (49%);
INFRA Group (40%);
INOX Air Products Private Limited (50%);
Jazan Gas Projects Company (26%);
Kulim Industrial Gases Sdn. Bhd. (50%);
Sapio Produzione Idrogeno Ossigeno S.r.l. (49%);
Tecnologia en Nitrogeno S. de R.L. de C.V. (50%);
Tyczka Industrie-Gases GmbH (50%);
and principally, other industrial gas producers.

30 September	**2020**	2019
Current assets	**$1,943.5**	$1,660.6
Noncurrent assets	**4,529.2**	4,400.4
Current liabilities	**765.3**	725.1
Noncurrent liabilities	**2,958.8**	2,853.6

Year Ended 30 September	**2020**	2019	2018
Net sales	**$2,809.1**	$2,885.6	$2,663.1
Sales less cost of sales	**1,212.5**	1,193.4	1,050.6
Operating income	**748.6**	763.4	635.3
Net income	**567.8**	492.4	388.0

Dividends received from equity affiliates were $107.0, $144.3, and $122.5 in fiscal years 2020, 2019, and 2018, respectively.

The investment in net assets of and advances to equity affiliates as of 30 September 2020 and 2019 included investment in foreign affiliates of $1,431.3 and $1,275.4, respectively.

As of 30 September 2020 and 2019, the amount of investment in companies accounted for by the equity method included equity method goodwill of $50.0 and $42.8, respectively.

India Finance Act 2020

For the fiscal year ended 30 September 2020, equity affiliates' income includes a benefit of $33.8 due to tax legislation passed by the Indian government (the "India Finance Act"). This benefit relates to INOX Air Products Private Limited for the release of our share of accumulated dividend distribution taxes and is included in the fiscal year 2020 net income on a 100% basis in the table above. Refer to Note 22, *Income Taxes*, for additional information.

U.S. Tax Cuts and Jobs Act

For the fiscal year ended 30 September 2018, equity affiliates' income includes an expense of $28.5 for our proportionate share of the impact of the U.S. Tax Cuts and Jobs Act primarily recorded during the first quarter of fiscal year 2018. This expense is included in the fiscal year 2018 net income on a 100% basis in the table above. Refer to Note 22, *Income Taxes*, for additional information.

Jazan Gas Project Company

On 19 April 2015, a joint venture between Air Products and ACWA Holding entered into a 20-year oxygen and nitrogen supply agreement to supply Saudi Aramco's oil refinery and power plant being built in Jazan, Saudi Arabia. Air Products owns 26% of the joint venture and guarantees the repayment of its share of an equity bridge loan. ACWA also guarantees their share of the loan. We determined that the joint venture is a variable interest entity, for which we are not the primary beneficiary. As of 30 September 2020, our consolidated balance sheets included $94.4 reflected within "Payables and accrued liabilities" for our obligation to make future equity contributions in 2021 based on our proportionate share of the advances received by the joint venture under the loan.

9. PLANT AND EQUIPMENT, NET

The major classes of plant and equipment are as follows:

30 September	Useful Life in years	2020	2019
Land		**$296.8**	$281.5
Buildings	30	**997.8**	946.8
Production facilities[(A)]	10 to 20	**17,289.7**	15,602.1
Distribution and other machinery and equipment[(B)]	5 to 25	**4,807.7**	4,491.9
Construction in progress		**1,784.2**	1,011.4
Plant and equipment, at cost		**25,176.2**	22,333.7
Less: Accumulated depreciation		**13,211.5**	11,996.1
Plant and equipment, net		**$11,964.7**	$10,337.6

(A) Depreciable lives of production facilities related to long-term customer supply contracts are matched to the contract lives.

(B) The depreciable lives for various types of distribution equipment are: 10 to 25 years for cylinders, depending on the nature and properties of the product; 20 years for tanks; 7.5 years for customer stations; and 5 to 15 years for tractors and trailers.

Depreciation expense was $1,150.5, $1,049.7, and $940.7 in fiscal years 2020, 2019, and 2018, respectively.

10. GOODWILL

Changes to the carrying amount of consolidated goodwill by segment are as follows:

	Industrial Gases–Americas	Industrial Gases–EMEA	Industrial Gases–Asia	Industrial Gases–Global	Corporate and other	Total
Goodwill, net at 30 September 2018	$162.1	$424.4	$171.9	$20.1	$10.4	$788.9
Acquisitions	—	38.5	10.1	—	—	48.6
Currency translation and other	(5.8)	(30.6)	(3.5)	(0.5)	—	(40.4)
Goodwill, net at 30 September 2019	$156.3	$432.3	$178.5	$19.6	$10.4	$797.1
Acquisitions	—	66.6	—	—	4.5	71.1
Currency translation and other	(3.7)	25.2	1.9	(0.1)	—	23.3
Goodwill, net at 30 September 2020	**$152.6**	**$524.1**	**$180.4**	**$19.5**	**$14.9**	**$891.5**

30 September	2020	2019	2018
Goodwill, gross	**$1,230.2**	$1,162.2	$1,194.7
Accumulated impairment losses[(A)]	**(338.7)**	(365.1)	(405.8)
Goodwill, net	**$891.5**	$797.1	$788.9

(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. The impairment test for goodwill involves calculating the fair value of each reporting unit and comparing that value to the carrying value. If the fair value of the reporting unit is less than its carrying value, the difference is recorded as a goodwill impairment charge, not to exceed the total amount of goodwill allocated to that reporting unit. During the fourth quarter of fiscal year 2020, we conducted our annual goodwill impairment test and determined that the fair value of all our reporting units exceeded their carrying value.

11. INTANGIBLE ASSETS

The table below summarizes the major classes of our intangible assets:

	2020			2019		
30 September	**Gross**	**Accumulated Amortization/ Impairment**	**Net**	Gross	Accumulated Amortization/ Impairment	Net
Customer relationships	**$538.0**	**($209.9)**	**$328.1**	$487.9	($179.8)	$308.1
Patents and technology	**39.1**	**(16.3)**	**22.8**	39.0	(13.3)	25.7
Other	**77.6**	**(33.7)**	**43.9**	75.0	(33.4)	41.6
Total finite-lived intangible assets	**654.7**	**(259.9)**	**394.8**	601.9	(226.5)	375.4
Trade names and trademarks (indefinite-lived)	**52.2**	**(11.2)**	**41.0**	56.2	(12.1)	44.1
Total Intangible Assets	**$706.9**	**($271.1)**	**$435.8**	$658.1	($238.6)	$419.5

The increase in net intangible assets in fiscal year 2020 was primarily attributable to intangible assets acquired through business combinations, partially offset by amortization.

Amortization expense for intangible assets was $34.5, $33.1, and $30.0 in fiscal years 2020, 2019, and 2018, respectively. Refer to Note 1, *Major Accounting Policies*, for the amortization periods for each major class of intangible assets. The table below details projected annual amortization expense for intangible assets as of 30 September 2020:

2021	$36.6
2022	34.1
2023	33.0
2024	31.8
2025	30.7
Thereafter	228.6
Total	$394.8

Indefinite-lived intangible assets are subject to impairment testing at least annually or more frequently if events or changes in circumstances indicate that potential impairment exists. The impairment test for indefinite-lived intangible assets involves calculating the fair value of the indefinite-lived intangible assets and comparing the fair value to their carrying value. If the fair value is less than the carrying value, the difference is recorded as an impairment loss. During the fourth quarter of fiscal year 2020, we conducted our annual impairment test of indefinite-lived intangible assets and determined that the fair value of all our intangible assets exceeded their carrying value.

12. 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, *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

We are 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 fiscal year 2020 was $80.1. This amount excludes short-term and variable lease expenses, which were not material.

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

	30 September 2020	1 October 2019
Operating lease ROU asset		
Other noncurrent assets	**$376.8**	$332.3
Operating lease liabilities		
Payables and accrued liabilities	**70.7**	68.6
Other noncurrent liabilities	**335.8**	306.7
Total Operating Lease Liabilities	**$406.5**	$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.

	30 September 2020
Weighted-average remaining lease term (in years)[(A)]	15.7
Weighted-average discount rate[(B)]	2.1 %

(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 and the remaining balance of the lease payments for each lease as of the reporting date.

At 30 September 2020, the maturity analysis of lease liabilities, showing the undiscounted cash flows, were as follows:

	Operating Leases
2021	$78.5
2022	55.7
2023	46.5
2024	37.5
2025	30.5
Thereafter	226.0
Total Undiscounted Lease Payments	474.7
Imputed interest	(68.2)
Present Value of Lease Liability Recognized on the Balance Sheet	$406.5

As previously disclosed in our 2019 Form 10-K, at 30 September 2019, prior to our adoption of the new lease guidance, our rent expense under operating leases, including month-to-month agreements was $87.0 and $82.7 in fiscal years 2019 and 2018, respectively. In addition, 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 operating lease expense of $80.1 as well as a use of cash of $90.0 for payments on amounts included in the measurement of the lease liability for fiscal year 2020.

In addition to the ROU assets established upon adoption, we recorded $110 of non-cash additions during fiscal year 2020.

We have additional operating leases that have not yet commenced as of 30 September 2020 having lease payments totaling approximately $60.

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. As we generally control the operations and maintenance of the assets that provide the supply of gas to our customers, there have been no new arrangements that qualified as a lease in fiscal year 2020.

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 fiscal year 2020, we recognized interest income of $71.2 on our lease receivables.

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." As of 30 September 2020 and 2019, the credit quality of lease receivables did not require a material allowance for credit losses.

Lease payments collected in fiscal years 2020, 2019, and 2018 were $162.8, $171.6, and $182.7, respectively. These payments reduced the lease receivable balance by $91.6, $94.6, and $97.4 in fiscal years 2020, 2019, and 2018, respectively.

At 30 September 2020, minimum lease payments expected to be collected, which reconciles to lease receivables, net, were as follows:

2021	$153.9
2022	147.0
2023	142.5
2024	136.2
2025	130.7
Thereafter	608.5
Total	1,318.8
Unearned interest income	(415.8)
Lease Receivables, net	$903.0

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 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.

13. 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 and third-party debt. 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 30 September 2020 is 2.8 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:

	2020		2019	
30 September	**US$ Notional**	**Years Average Maturity**	US$ Notional	Years Average Maturity
Forward Exchange Contracts				
Cash flow hedges	**$2,842.1**	**0.5**	$2,418.2	0.5
Net investment hedges	**636.6**	**3.8**	830.8	0.9
Not designated	**1,685.2**	**0.3**	1,053.5	0.6
Total Forward Exchange Contracts	**$5,163.9**	**0.8**	$4,302.5	0.6

The increase in the notional value of cash flow hedges from 30 September 2019 to 30 September 2020 is primarily due to the addition of a forward exchange contract that hedges the repayment of our Eurobond maturing in fiscal year 2021. The increase in the notional value of our forward exchange contracts that are not designated is primarily due to the origination of forward exchange contracts that offset other forward exchange contracts previously designated as net investment hedges or cash flow hedges that were de-designated during fiscal year 2020.

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 €1,288.7 million ($1,510.8) at 30 September 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 30 September 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.

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

	2020				2019			
30 September	**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 %**	**1.1**	$200.0	LIBOR	2.76 %	2.1
Cross currency interest rate swaps (net investment hedge)	**$201.6**	**4.27 %**	**3.12 %**	**3.2**	$216.8	4.80 %	3.31 %	3.5
Cross currency interest rate swaps (cash flow hedge)	**$1,057.9**	**4.83 %**	**2.98 %**	**2.5**	$1,129.3	4.92 %	3.04 %	2.3
Cross currency interest rate swaps (not designated)	**$12.8**	**5.39 %**	**3.54 %**	**3.2**	$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:

	Carrying amounts of hedged item		Cumulative hedging adjustment, included in carrying amount	
30 September	**2020**	2019	**2020**	2019
Long-term debt	**$405.4**	$404.7	**$5.7**	$5.2

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

30 September	Balance Sheet Location	**2020**	2019	Balance Sheet Location	**2020**	2019
Derivatives Designated as Hedging Instruments:						
Forward exchange contracts	Other receivables and current assets	**$51.1**	$79.0	Payables and accrued liabilities	**$22.5**	$53.8
Interest rate management contracts	Other receivables and current assets	**14.7**	24.8	Payables and accrued liabilities	**0.4**	1.1
Forward exchange contracts	Other noncurrent assets	**0.8**	11.9	Other noncurrent liabilities	**33.0**	0.7
Interest rate management contracts	Other noncurrent assets	**44.3**	60.9	Other noncurrent liabilities	**1.7**	0.7
Total Derivatives Designated as Hedging Instruments		**$110.9**	$176.6		**$57.6**	$56.3
Derivatives Not Designated as Hedging Instruments:						
Forward exchange contracts	Other receivables and current assets	**$31.7**	$38.7	Payables and accrued liabilities	**$28.0**	$36.3
Forward exchange contracts	Other noncurrent assets	**—**	8.4	Other noncurrent liabilities	**—**	19.8
Interest rate management contracts	Other noncurrent assets	**0.7**	0.5	Other noncurrent liabilities	**—**	—
Total Derivatives Not Designated as Hedging Instruments		**$32.4**	$47.6		**$28.0**	$56.1
Total Derivatives		**$143.3**	$224.2		**$85.6**	$112.4

Refer to Note 14, *Fair Value Measurements*, which defines fair value, describes the method for measuring fair value, and provides additional disclosures regarding fair value measurements.

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

	2020	2019
Net Investment Hedging Relationships		
Forward exchange contracts	**($15.9)**	$51.5
Foreign currency debt	**(100.2)**	65.3
Cross currency interest rate swaps	**1.9**	12.6
Total Amount Recognized in OCI	**(114.2)**	129.4
Tax effects	**28.2**	(30.9)
Net Amount Recognized in OCI	**($86.0)**	$98.5

	2020	2019
Derivatives in Cash Flow Hedging Relationships		
Forward exchange contracts	**$116.6**	($30.3)
Forward exchange contracts, excluded components	**(15.2)**	(16.1)
Other[(A)]	**(34.2)**	0.8
Total Amount Recognized in OCI	**67.2**	(45.6)
Tax effects	**(23.7)**	1.5
Net Amount Recognized in OCI	**$43.5**	($44.1)

(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.

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

	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	**$8,856.3**	$8,918.9	**$5,858.1**	$5,975.5	**$65.4**	$49.3	**$109.3**	$137.0	**$30.7**	$66.7
(Gain) Loss Effects of Cash Flow Hedging:										
Forward Exchange Contracts:										
Amount reclassified from OCI into income[(A)]	**($0.2)**	$0.5	**($1.0)**	$0.3	**$—**	$28.5	**$—**	$16.0	**($117.9)**	$—
Amount excluded from effectiveness testing recognized in earnings based on amortization approach[(A)]	**—**	—	**—**	—	**—**	—	**—**	—	**17.0**	—
Other:										
Amount reclassified from OCI into income[(B)]	**—**	—	**—**	—	**—**	(32.4)	**4.2**	3.9	**22.5**	—
Total (Gain) Loss Reclassified from OCI to Income	**(0.2)**	0.5	**(1.0)**	0.3	**—**	(3.9)	**4.2**	19.9	**(78.4)**	—
Tax effects	**—**	(0.1)	**0.2**	(0.1)	**—**	0.9	**(1.4)**	(5.2)	**18.9**	—
Net (Gain) Loss Reclassified from OCI to Income	**($0.2)**	$0.4	**($0.8)**	$0.2	**$—**	($3.0)	**$2.8**	$14.7	**($59.5)**	$—
(Gain) Loss Effects of Fair Value Hedging:										
Other:										
Hedged items	**$—**	$—	**$—**	$—	**$—**	$—	**$0.5**	$4.3	**$—**	$—
Derivatives designated as hedging instruments	**—**	—	**—**	—	**—**	—	**(0.5)**	(4.3)	**—**	—
Total (Gain) Loss Recognized in Income	**$—**	$—	**$—**	$—	**$—**	$—	**$—**	$—	**$—**	$—

(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 table below summarizes the location and amounts recognized in income related to our derivatives not designated as hedging instruments by contract type:

	Other Income (Expense), Net		Other Non-Operating Income (Expense), Net	
	2020	2019	**2020**	2019
The Effects of Derivatives Not Designated as Hedging Instruments:				
Forward Exchange Contracts	**($1.5)**	$1.3	**$1.1**	$—
Other	**—**	(2.0)	**0.7**	—
Total (Gain) Loss Recognized in Income	**($1.5)**	($0.7)	**$1.8**	$—

The amount of unrealized gains and losses related to cash flow hedges as of 30 September 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 $30.0 and $30.1 as of 30 September 2020 and 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 $76.5 and $157.1 as of 30 September 2020 and 2019, respectively. No financial institution is required to post collateral at this time, as all have credit ratings at or above threshold.

14. 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. 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 13, *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:

	2020		2019	
30 September	**Carrying Value**	**Fair Value**	Carrying Value	Fair Value
Assets				
Derivatives				
Forward exchange contracts	**$83.6**	**$83.6**	$138.0	$138.0
Interest rate management contracts	**59.7**	**59.7**	86.2	86.2
Liabilities				
Derivatives				
Forward exchange contracts	**$83.5**	**$83.5**	$110.6	$110.6
Interest rate management contracts	**2.1**	**2.1**	1.8	1.8
Long-term debt, including current portion and related party	**7,900.1**	**8,278.4**	3,267.8	3,350.9

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:

	2020				2019			
30 September	**Total**	**Level 1**	**Level 2**	**Level 3**	Total	Level 1	Level 2	Level 3
Assets at Fair Value								
Derivatives								
Forward exchange contracts	**$83.6**	**$—**	**$83.6**	**$—**	$138.0	$—	$138.0	$—
Interest rate management contracts	**59.7**	**—**	**59.7**	**—**	86.2	—	86.2	—
Total Assets at Fair Value	**$143.3**	**$—**	**$143.3**	**$—**	$224.2	$—	$224.2	$—
Liabilities at Fair Value								
Derivatives								
Forward exchange contracts	**$83.5**	**$—**	**$83.5**	**$—**	$110.6	$—	$110.6	$—
Interest rate management contracts	**2.1**	**—**	**2.1**	**—**	1.8	—	1.8	—
Total Liabilities at Fair Value	**$85.6**	**$—**	**$85.6**	**$—**	$112.4	$—	$112.4	$—

15. DEBT

In fiscal year 2020, Air Products issued U.S. Dollar- and Euro-denominated fixed-rate notes in multiple tranches with aggregate principal amounts of $3.8 billion and €1.0 billion ($1.2 billion as of 30 September 2020), respectively. The U.S. Dollar-denominated notes were issued on 30 April 2020, and the Euro-denominated notes were issued on 5 May 2020. The proceeds from these notes were reduced by deferred financing charges and discounts of approximately $45, which are being amortized over the life of the underlying bonds. We intend to use the majority of the proceeds to fund growth projects and repay debt maturities through 2021. In August 2020, we repaid a 2.0% Eurobond of €300.0 million that had been previously reflected as long-term debt due to our intent to refinance as of 30 September 2019.

Total Debt

The table below summarizes our total outstanding debt as reflected on our consolidated balance sheets as of 30 September 2020 and 2019:

30 September	**2020**	2019
Short-term borrowings[(A)]	**$7.7**	$58.2
Current portion of long-term debt[(B)(C)]	**470.0**	40.4
Long-term debt	**7,132.9**	2,907.3
Long-term debt – related party[(B)]	**297.2**	320.1
Total Debt	**$7,907.8**	$3,326.0

(A) Includes bank obligations with weighted average interest rates of 1.6% and 3.7% as of 30 September 2020 and 2019, respectively.

(B) Our related party debt resulted from the 2018 acquisition of gasification and syngas clean-up assets from our joint venture partner, Lu'An, who partially funded the acquisition with a loan to the joint venture.

(C) Includes current portions of long-term debt owed to Lu'An of $41.3 and $37.8 as of 30 September 2020 and 2019, respectively.

Long-term Debt

The coupon interest rates, maturities, and carrying amounts of our long-term debt as of 30 September 2020 and 2019 are summarized in the table below:

30 September	Fiscal Year Maturities	**2020**	2019
Payable in U.S. Dollars			
Debentures			
8.75%	2021	**$18.4**	$18.4
Medium-term Notes (weighted average rate)			
Series E 7.6%	2026	**17.2**	17.2
Senior Notes			
Note 3.0%	2022	**400.0**	400.0
Note 2.75%	2023	**400.0**	400.0
Note 3.35%	2024	**400.0**	400.0
Note 1.50%	2026	**550.0**	—
Note 1.85%	2027	**650.0**	—
Note 2.05%	2030	**900.0**	—
Note 2.70%	2040	**750.0**	—
Note 2.80%	2050	**950.0**	—
Other (weighted average rate)			
Variable-rate industrial revenue bonds 0.1%	2035 to 2050	**631.9**	631.9

30 September	Fiscal Year Maturities	2020	2019
Payable in Other Currencies			
Eurobonds 2.0%	2020	**—**	327.0
Eurobonds 0.375%	2021	**410.3**	381.5
Eurobonds 1.0%	2025	**351.7**	327.0
Eurobonds 0.50%	2028	**586.2**	—
Eurobonds 0.80%	2032	**586.2**	—
Other	2023	**0.6**	3.8
Related Party			
Chinese Renminbi 5.5%	2021 to 2027	**338.5**	357.9
Capital Lease Obligations *(weighted average rate)*			
Foreign 10.9%	2021 to 2036	**9.2**	10.1
Total Principal Amount		**7,950.2**	3,274.8
Less: Unamortized discount and debt issuance costs		**(55.8)**	(12.2)
Less: Fair value hedge accounting adjustments[(A)]		**5.7**	5.2
Total Long-term Debt		**7,900.1**	3,267.8
Less: Current portion of long-term debt		**(470.0)**	(40.4)
Less: Long-term debt – related party		**(297.2)**	(320.1)
Long-term Debt		**$7,132.9**	$2,907.3

(A) We have entered into LIBOR-based interest rate swap arrangements with various counterparty financial institutions on the 3.0% Senior Note maturing in fiscal year 2022. These interest rate swaps have been designated as fair value hedges of the Note. Refer to Note 13, *Financial Instruments*, for additional information.

Maturities of long-term debt, including principal amounts owed to related parties, in each of the next five years and thereafter are as follows:

2021	$470.4
2022	441.7
2023	456.3
2024	456.4
2025	415.8
Thereafter	5,709.6
Total	**$7,950.2**

Various debt agreements to which we are a party include financial covenants and other restrictions, including restrictions pertaining to the ability to create property liens and enter into certain sale and leaseback transactions. As of 30 September 2020, we are in compliance with all the financial and other covenants under our debt agreements.

There were no additional commitments maintained by our foreign subsidiaries as of 30 September 2020.

Cash paid for interest, net of amounts capitalized, was $67.2, $155.9, and $123.1 in fiscal years 2020, 2019, and 2018, respectively.

Credit Agreement

We have a $2,300 five-year revolving credit agreement maturing 31 March 2022 with a syndicate of banks (the "Credit Agreement"). Under the Credit Agreement, senior unsecured debt is available to us and certain of our subsidiaries. The Credit Agreement provides us a source of liquidity and supports our commercial paper program. Our only financial covenant under the Credit Agreement is a maximum ratio of total debt to total capitalization, or total debt plus total equity, no greater than 70%. No borrowings were outstanding under the Credit Agreement as of 30 September 2020.

16. RETIREMENT BENEFITS

We and certain of our subsidiaries sponsor defined benefit pension plans and defined contribution plans that cover a substantial portion of our worldwide employees. The principal defined benefit pension plans are the U.S. salaried pension plan and the U.K. pension plan. These plans were closed to new participants in 2005, after which defined contribution plans were offered to new employees. The principal defined contribution plan is the Retirement Savings Plan, in which a substantial portion of the U.S. employees participate. A similar plan is offered to U.K. employees. We also provide other postretirement benefits consisting primarily of healthcare benefits to U.S. retirees who meet age and service requirements.

Defined Benefit Pension Plans

Pension benefits earned are generally based on years of service and compensation during active employment. The components of net periodic benefit cost for our defined benefit pension plans for fiscal years 2020, 2019, and 2018 were as follows:

	2020		2019		2018	
Year Ended 30 September	**U.S.**	**International**	U.S.	International	U.S.	International
Service cost	**$23.4**	**$23.3**	$21.4	$19.3	$25.5	$25.5
Interest cost	**91.2**	**24.8**	113.4	35.8	107.2	37.3
Expected return on plan assets	**(188.7)**	**(77.4)**	(172.5)	(75.1)	(201.6)	(81.7)
Prior service cost amortization	**1.2**	**—**	1.1	—	1.6	—
Actuarial loss amortization	**83.7**	**19.5**	65.3	10.9	87.4	40.2
Settlements	**5.0**	**0.2**	6.2	0.2	45.0	3.5
Special termination benefits	**—**	**—**	0.7	0.1	0.4	—
Other	**—**	**0.8**	—	0.8	—	1.5
Net Periodic (Benefit) Cost	**$15.8**	**($8.8)**	$35.6	($8.0)	$65.5	$26.3

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 fiscal years 2020, 2019 and 2018 were not material. The non-service related costs, including pension settlement losses, are presented outside operating income within "Other non-operating income (expense), net."

During the fourth quarter of fiscal year 2018, we recognized a pension settlement loss of $43.7 primarily in connection with the transfer of certain pension assets and payment obligations for our U.S. salaried and hourly plans to an insurer through the purchase of an irrevocable, nonparticipating group annuity contract. The transaction does not change the amount of the monthly pension benefits received by affected retirees.

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 $5.0, $6.2 and $5.2 in fiscal years 2020, 2019 and 2018, 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.

We calculate net periodic benefit cost for a given fiscal year based on assumptions developed at the end of the previous fiscal year. The following table sets forth the weighted average assumptions used in the calculation of net periodic benefit cost:

	2020		2019		2018	
	U.S.	**International**	U.S.	International	U.S.	International
Discount rate – Service cost	**3.3 %**	**1.5 %**	4.3 %	2.5 %	3.9 %	2.6 %
Discount rate – Interest cost	**2.9 %**	**1.3 %**	4.0 %	2.2 %	3.3 %	2.2 %
Expected return on plan assets	**7.0 %**	**5.0 %**	7.0 %	5.3 %	7.5 %	5.8 %
Rate of compensation increase	**3.5 %**	**3.3 %**	3.5 %	3.5 %	3.5 %	3.6 %

The projected benefit obligation ("PBO") is the actuarial present value of benefits attributable to employee service rendered to date, including the effects of estimated future salary increases. The following table sets forth the weighted average assumptions used in the calculation of the PBO:

	2020		2019	
	U.S.	**International**	U.S.	International
Discount rate	**2.7 %**	**1.5 %**	3.2 %	1.5 %
Rate of compensation increase	**3.5 %**	**3.3 %**	3.5 %	3.3 %

The following tables reflect the change in the PBO and the change in the fair value of plan assets based on the plan year measurement date, as well as the amounts recognized in the consolidated balance sheets:

	2020		2019	
	U.S.	**International**	U.S.	International
Change in Projected Benefit Obligation				
Obligation at beginning of year	**$3,281.6**	**$1,864.0**	$2,922.8	$1,660.5
Service cost	**23.4**	**23.3**	21.4	19.3
Interest cost	**91.2**	**24.8**	113.4	35.8
Amendments	**1.6**	**—**	1.1	4.7
Actuarial loss (gain)	**190.5**	**(11.6)**	380.3	300.2
Settlements	**(11.7)**	**(0.9)**	(12.2)	(1.6)
Special termination benefits	**—**	**—**	0.7	0.1
Participant contributions	**—**	**1.2**	—	1.3
Benefits paid	**(152.5)**	**(49.8)**	(146.2)	(47.7)
Currency translation and other	**(0.3)**	**98.7**	0.3	(108.6)
Obligation at End of Year	**$3,423.8**	**$1,949.7**	$3,281.6	$1,864.0

	2020		2019	
	U.S.	**International**	U.S.	International
Change in Plan Assets				
Fair value at beginning of year	**$2,832.4**	**$1,672.4**	$2,684.9	$1,588.2
Actual return on plan assets	**364.6**	**(3.1)**	289.9	208.0
Company contributions	**15.5**	**22.0**	16.0	24.2
Participant contributions	**—**	**1.2**	—	1.3
Benefits paid	**(152.5)**	**(49.8)**	(146.2)	(47.7)
Settlements	**(11.7)**	**(0.9)**	(12.2)	(1.6)
Currency translation and other	**—**	**85.0**	—	(100.0)
Fair Value at End of Year	**$3,048.3**	**$1,726.8**	$2,832.4	$1,672.4
Funded Status at End of Year	**($375.5)**	**($222.9)**	($449.2)	($191.6)

	2020		2019	
	U.S.	**International**	U.S.	International
Amounts Recognized				
Noncurrent assets	**$26.5**	**$—**	$17.3	$11.4
Accrued liabilities	**10.5**	**0.2**	18.3	—
Noncurrent liabilities	**391.5**	**222.7**	448.2	203.0
Net Liability Recognized	**$375.5**	**$222.9**	$449.2	$191.6

The changes in plan assets and benefit obligation that have been recognized in other comprehensive income on a pretax basis during fiscal years 2020 and 2019 consist of the following:

	2020		2019	
	U.S.	**International**	U.S.	International
Net actuarial loss arising during the period	**$14.6**	**$68.9**	$262.9	$161.5
Amortization of net actuarial loss	**(88.7)**	**(19.7)**	(71.5)	(11.1)
Prior service cost arising during the period	**1.6**	**—**	1.1	4.7
Amortization of prior service cost	**(1.2)**	**—**	(1.1)	—
Total	**($73.7)**	**$49.2**	$191.4	$155.1

The net actuarial loss represents the actual changes in the estimated obligation and plan assets that have not yet been recognized in the consolidated income statements and are included in accumulated other comprehensive loss. Actuarial losses arising during fiscal year 2020 are primarily attributable to lower discount rates, partially offset by higher than expected return on plan assets. Accumulated actuarial gains and losses that exceed a corridor are amortized over the average remaining service period of U.S. participants, which was approximately seven years as of 30 September 2020. For U.K. participants, accumulated actuarial gains and losses that exceed a corridor are amortized over the average remaining life expectancy, which was approximately twenty-five years as of 30 September 2020.

The components recognized in accumulated other comprehensive loss on a pretax basis at 30 September consisted of the following:

	2020		2019	
	U.S.	**International**	U.S.	International
Net actuarial loss	**$797.7**	**$643.2**	$871.8	$594.0
Prior service cost (credit)	**7.0**	**3.6**	6.6	3.6
Net transition liability	**—**	**0.4**	—	0.4
Total	**$804.7**	**$647.2**	$878.4	$598.0

The accumulated benefit obligation ("ABO") is the actuarial present value of benefits attributed to employee service rendered to a particular date, based on current salaries. The ABO for all defined benefit pension plans was $5,166.5 and $4,931.6 as of 30 September 2020 and 2019, respectively.

The following table provides information on pension plans where the benefit liability exceeds the value of plan assets:

	2020		2019	
30 September	**U.S.**	**International**	U.S.	International
Pension Plans with PBO in Excess of Plan Assets:				
PBO	**$3,202.2**	**$1,949.7**	$3,069.2	$521.1
Fair value of plan assets	**2,800.3**	**1,726.7**	2,602.8	318.0
PBO in excess of plan assets	**$401.9**	**$223.0**	$466.4	$203.1
Pension Plans with ABO in Excess of Plan Assets:				
ABO	**$3,081.4**	**$475.8**	$2,941.2	$413.3
Fair value of plan assets	**2,800.3**	**324.4**	2,602.8	266.5
ABO in excess of plan assets	**$281.1**	**$151.4**	$338.4	$146.8

The tables above include several pension arrangements that are not funded because of jurisdictional practice. The ABO and PBO related to these plans as of 30 September 2020 were $86.6 and $91.7, respectively. As of 30 September 2019, the U.K. pension plan had plan assets in excess of both PBO and ABO and was therefore not included in the table above. As of 30 September 2020, the PBO of this plan exceeded the fair value of plan assets, resulting in an increase to the International balances.

Pension Plan Assets

Our pension plan investment strategy is to invest in diversified portfolios to earn a long-term return consistent with acceptable risk in order to pay retirement benefits and meet regulatory funding requirements while minimizing company cash contributions over time. De-risking strategies are also employed for closed plans as funding improves, generally resulting in higher allocations to long duration bonds. The plans invest primarily in passive and actively managed equity and debt securities. Equity investments are diversified geographically and by investment style and market capitalization. Fixed income investments include sovereign, corporate and asset-backed securities generally denominated in the currency of the plan.

Asset allocation targets are established based on the long-term return, volatility and correlation characteristics of the asset classes, the profiles of the plans' liabilities, and acceptable levels of risk. Assets are routinely rebalanced through contributions, benefit payments, and otherwise as deemed appropriate. The actual and target allocations at the measurement date are as follows:

	2020 Target Allocation		2020 Actual Allocation		2019 Actual Allocation	
	U.S.	**International**	**U.S.**	**International**	U.S.	International
Asset Category						
Equity securities	**42 - 57%**	**40 - 49%**	**51 %**	**43 %**	38 %	42 %
Debt securities	**35 - 50%**	**51 - 60%**	**43 %**	**56 %**	56 %	57 %
Real estate and other	**— - 10%**	**— %**	**5 %**	**— %**	6 %	— %
Cash	**— %**	**— %**	**1 %**	**1 %**	— %	1 %
Total			**100 %**	**100 %**	100 %	100 %

In fiscal year 2020, the 7.0% expected return for U.S. plan assets was based on a weighted average of estimated long-term returns of major asset classes and the historical performance of plan assets. The estimated long-term return for equity, debt securities, and real estate is 7.6%, 5.1%, and 6.5%, respectively. In determining asset class returns, we take into account historical long-term returns and the value of active management, as well as other economic and market factors.

In fiscal year 2020, the 5.0% expected rate of return for international plan assets was based on a weighted average return for plans outside the U.S., which vary significantly in size, asset structure and expected returns. The expected asset return for the U.K. plan, which represents over 80% of the assets of our International plans, is 5.7% and was derived from expected equity and debt security returns of 7.3% and 1.8%, respectively.

The following table summarizes pension plan assets measured at fair value by asset class (see Note 14, *Fair Value Measurements*, for definition of the levels):

	2020				2019			
30 September	**Total**	**Level 1**	**Level 2**	**Level 3**	Total	Level 1	Level 2	Level 3
U.S. Qualified Pension Plans								
Cash and cash equivalents	**$16.9**	**$16.9**	**$—**	**$—**	$13.7	$13.7	$—	$—
Equity securities	**573.9**	**573.9**	**—**	**—**	401.1	401.1	—	—
Equity mutual funds	**213.1**	**213.1**	**—**	**—**	152.9	152.9	—	—
Equity pooled funds	**762.0**	**—**	**762.0**	**—**	524.8	—	524.8	—
Fixed income:								
Bonds (government and corporate)	**1,312.7**	**—**	**1,312.7**	**—**	1,572.1	—	1,572.1	—
Total U.S. Qualified Pension Plans at Fair Value	**$2,878.6**	**$803.9**	**$2,074.7**	**$—**	$2,664.6	$567.7	$2,096.9	$—
Real estate pooled funds[(A)]	**169.7**				167.8			
Total U.S. Qualified Pension Plans	**$3,048.3**				$2,832.4			
International Pension Plans								
Cash and cash equivalents	**$13.9**	**$13.9**	**$—**	**$—**	$13.4	$13.4	$—	$—
Equity pooled funds	**746.8**	**—**	**746.8**	**—**	711.3	—	711.3	—
Fixed income pooled funds	**694.1**	**—**	**694.1**	**—**	679.9	—	679.9	—
Other pooled funds	**15.5**	**—**	**15.5**	**—**	13.7	—	13.7	—
Insurance contracts	**256.5**	**—**	**—**	**256.5**	254.1	—	—	254.1
Total International Pension Plans	**$1,726.8**	**$13.9**	**$1,456.4**	**$256.5**	$1,672.4	$13.4	$1,404.9	$254.1

(A) Real estate pooled funds consist of funds that invest in properties. These funds generally allow for quarterly redemption with 30 days' notice. Timing for redemption could be delayed based on the priority of our request and the availability of funds. Interests in these funds are valued using the net asset value ("NAV") per share practical expedient and are not classified in the fair value hierarchy.

The following table summarizes changes in fair value of the pension plan assets classified as Level 3, which comprised of investments in insurance contracts:

Balance at 30 September 2018	$217.7
Actual return on plan assets:	
Assets held at end of year	38.1
Purchases, sales, and settlements, net	(1.7)
Balance at 30 September 2019	$254.1
Actual return on plan assets:	
Assets held at end of year	2.4
Balance at 30 September 2020	**$256.5**

The descriptions and fair value methodologies for the U.S. and International pension plan assets are as follows:

Cash and Cash Equivalents

The carrying amounts of cash and cash equivalents approximate fair value due to the short-term maturity.

Equity Securities

Equity securities are valued at the closing market price reported on a U.S. or international exchange where the security is actively traded and are therefore classified as Level 1 assets.

Equity Mutual and Pooled Funds

Shares of mutual funds are valued at the NAV of the fund and are classified as Level 1 assets. Units of pooled funds are valued at the per unit NAV determined by the fund manager based on the value of the underlying traded holdings and are classified as Level 2 assets.

Corporate and Government Bonds

Corporate and government bonds are classified as Level 2 assets, as they are either valued at quoted market prices from observable pricing sources at the reporting date or valued based upon comparable securities with similar yields and credit ratings.

Other Pooled Funds

Other pooled funds classified as Level 2 assets are valued at the NAV of the shares held at year end, which is based on the fair value of the underlying investments.

Insurance Contracts

Insurance contracts are classified as Level 3 assets, as they are carried at contract value, which approximates the estimated fair value. The estimated fair value is based on the fair value of the underlying investment of the insurance company and discount rates that require inputs with limited observability.

Contributions and Projected Benefit Payments

Pension contributions to funded plans and benefit payments for unfunded plans for fiscal year 2020 were $37.5. Contributions for funded plans resulted primarily from contractual and regulatory requirements. Benefit payments to unfunded plans were due primarily to the timing of retirements. We anticipate contributing $45 to $55 to the defined benefit pension plans in fiscal year 2021. These contributions are anticipated to be driven primarily by contractual and regulatory requirements for funded plans and benefit payments for unfunded plans, which are dependent upon timing of retirements.

Projected benefit payments, which reflect expected future service, are as follows:

	U.S.	International
2021	$163.7	$52.0
2022	165.2	52.8
2023	169.8	56.9
2024	174.0	60.2
2025	177.9	59.9
2026-2030	932.6	334.4

These estimated benefit payments are based on assumptions about future events. Actual benefit payments may vary significantly from these estimates.

U.K. Lloyds 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.

Defined Contribution Plans

We maintain a non-leveraged employee stock ownership plan ("ESOP") which forms part of the Air Products and Chemicals, Inc. Retirement Savings Plan ("RSP"). The ESOP was established in May of 2002. The balance of the RSP is a qualified defined contribution plan including a 401(k) elective deferral component. A substantial portion of U.S. employees are eligible and participate.

We treat dividends paid on ESOP shares as ordinary dividends. Under existing tax law, we may deduct dividends which are paid with respect to shares held by the plan. Shares of our common stock in the ESOP totaled 2,001,152 as of 30 September 2020.

Our contributions to the RSP include a Company core contribution for certain eligible employees who do not receive their primary retirement benefit from the defined benefit pension plans, with the core contribution based on a percentage of pay that is dependent on years of service. For the RSP, we also make matching contributions on overall employee contributions as a percentage of the employee contribution and include an enhanced contribution for certain eligible employees that do not participate in the defined benefit pension plans. Worldwide contributions expensed to income in fiscal years 2020, 2019, and 2018 were $45.6, $40.6, and $34.2, respectively.

Other Postretirement Benefits

We provide other postretirement benefits consisting primarily of healthcare benefits to certain U.S. retirees who meet age and service requirements. The healthcare benefit is a continued medical benefit until the retiree reaches age 65. Healthcare benefits are contributory, with contributions adjusted periodically. The retiree medical costs are capped at a specified dollar amount, with the retiree contributing the remainder. The cost of these benefits were not material in fiscal years 2020, 2019, and 2018. Accumulated postretirement benefit obligations as of the end of fiscal years 2020 and 2019 were $38.6 and $43.7, respectively, of which $7.2 and $7.7 were current obligations, respectively.

We recognize changes in other postretirement benefit plan obligations in other comprehensive income on a pretax basis. In fiscal years 2020 and 2019, we recognized gains that arose during the period of $1.3 and $6.1, respectively. There was no net actuarial loss amortization in fiscal years 2020 and 2019 as the corridor for the plan was not exceeded.

The net actuarial gain/loss recognized in accumulated other comprehensive loss on a pretax basis was a net gain of $3.0 and $1.7 as of 30 September 2020 and 2019, respectively.

17. 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 $32 at 30 September 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 $32 at 30 September 2020) plus interest accrued thereon until final disposition of the proceedings.

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 30 September 2020 and 2019 included an accrual of $84.7 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 $84 to a reasonably possible upper exposure of $98 as of 30 September 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 30 September 2020, $42.2 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 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 cost review of the environmental remediation status at the Pace facility. The review was completed in conjunction with requirements to maintain financial assurance per the Consent Order issued by the FDEP and the USEPA 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 groundwater recovery wells and piping, in addition to future capital to consider the extended 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 corrective action management unit. Several groundwater recovery systems have been installed to contain and remove contamination from groundwater. We completed an extensive assessment of the site to determine the efficacy of existing measures, 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 remediate groundwater. 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 30 September 2020, $13.3 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 30 September 2020, $11.5 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.

Asset Retirement Obligations

Our asset retirement obligations are primarily associated with long-term on-site supply contracts under which we have built a facility on land owned by the customer and are obligated to remove the facility at the end of the contract term. The retirement of assets includes the contractually required removal of a long-lived asset from service and encompasses the sale, removal, abandonment, recycling, or disposal of the assets as required at the end of the contract term. These obligations are primarily reflected within "Other noncurrent liabilities" on the consolidated balance sheets. The timing and/or method of settlement of these obligations are conditional on a future event that may or may not be within our control.

Changes to the carrying amount of our asset retirement obligations were as follows:

Balance at 30 September 2018	$190.4
Additional accruals	14.7
Liabilities settled	(2.1)
Accretion expense	8.7
Currency translation adjustment	(3.5)
Balance at 30 September 2019	$208.2
Additional accruals	22.0
Liabilities settled	(2.8)
Accretion expense	9.5
Currency translation adjustment	4.5
Balance at 30 September 2020	**$241.4**

Guarantees and Warranties

We guaranteed the repayment of our 25% share of an equity bridge loan that has been provided to fund equity commitments to a joint venture arrangement with ACWA Holding in Saudi Arabia. ACWA also guarantees their share of the loan. Our maximum exposure under the guarantee, which expires in 2021, is approximately $100. As of 30 September 2020, our consolidated balance sheets included $94.4 reflected within "Payables and accrued liabilities" for our obligation to make future equity contributions in 2021 based on our proportionate share of the advances received by the joint venture under the loan.

Air Products has also entered into a long-term sale of equipment contract with the joint venture to engineer, procure, and construct the industrial gas facilities that will supply gases to Saudi Aramco. We provided bank guarantees to the joint venture to support our performance under the contract. As of 30 September 2020, our maximum potential payments were $247. Exposures under the guarantees will be extinguished after completion of the project.

We are party to an equity support agreement and operations guarantee related to an air separation facility constructed in Trinidad for a venture in which we own 50%. At 30 September 2020, maximum potential payments under joint and several guarantees were $25.0. Exposures under the guarantees decline over time and will be completely extinguished by 2024.

To date, no equity contributions or payments have been made since the inception of these guarantees. The fair value of the above guarantees is not material.

We, in the normal course of business operations, have issued product warranties related to equipment sales. Also, contracts often contain standard terms and conditions which typically include a warranty and indemnification to the buyer that the goods and services purchased do not infringe on third-party intellectual property rights. The provision for estimated future costs relating to warranties is not material to the consolidated financial statements.

We do not expect that any sum we may have to pay in connection with guarantees and warranties will have a material adverse effect on our consolidated financial condition, liquidity, or results of operations.

Unconditional Purchase Obligations

We are obligated to make future payments under unconditional purchase obligations as summarized below:

2021	$1,460
2022	460
2023	450
2024	455
2025	454
Thereafter	6,277
Total	**$9,556**

Approximately $7.9 billion of our unconditional purchase obligations relate to helium and rare gases. The majority of these obligations occur after fiscal year 2025. Helium purchases include crude feedstock supply to helium refining plants in North America as well as refined helium purchases from sources around the world. As a rare byproduct of natural gas production in the energy sector, these helium sourcing agreements are medium- to long-term and contain take-if-tendered provisions. The refined helium is distributed globally and sold as a merchant gas, primarily under medium-term requirements contracts. While contract terms in our helium sourcing contracts are generally longer than our customer sales contracts, helium is a rare gas used in applications with few or no substitutions because of its unique physical and chemical properties.

We estimate our maximum obligation for future purchases of plant and equipment to be approximately $1.0 billion based on open purchase orders as of 30 September 2020. Although open purchase orders are considered enforceable and legally binding, the terms generally allow us the option to reschedule, cancel, or otherwise modify based on our business needs. We have disclosed this obligation in fiscal year 2021; however, timing of actual satisfaction of the obligation may vary.

Our unconditional purchase obligations also include commitments for power and natural gas supply as well as feedstock supply or numerous HyCO (hydrogen, carbon monoxide, and syngas) facilities. Our long-term sales contracts to customers are generally matched to the term of these obligations and provide recovery of price increases. As a result, we do not believe these purchase obligations would have a material effect on our financial condition or results of operations.

18. CAPITAL STOCK

Common Stock

Authorized common stock consists of 300 million shares with a par value of $1 per share. As of 30 September 2020, 249 million shares were issued, with 221 million outstanding.

On 15 September 2011, the Board of Directors authorized the repurchase of up to $1.0 billion of our outstanding common stock. We repurchase shares pursuant to Rules 10b5-1 and 10b-18 under the Securities Exchange Act of 1934, as amended, through repurchase agreements established with several brokers. We did not purchase any of our outstanding shares during fiscal year 2020. At 30 September 2020, $485.3 in share repurchase authorization remains.

A summary of the changes in common shares in fiscal year 2020 is presented below:

Year Ended 30 September	2020	2019	2018
Number of common shares outstanding, beginning of year	**220,415,262**	219,515,245	218,346,074
Issuance of treasury shares for stock option and award plans	**602,197**	900,017	1,169,171
Number of common shares outstanding, end of year	**221,017,459**	220,415,262	219,515,245

Preferred Stock

Authorized preferred stock consisted of 25 million shares with a par value of $1 per share, of which 2.5 million were designated as Series A Junior Participating Preferred Stock. There were no preferred shares issued or outstanding as of 30 September 2020 and 2019.

19. SHARE-BASED COMPENSATION

We have various share-based compensation programs, which include deferred stock units, stock options, and restricted stock. During the fiscal year ended 30 September 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 30 September 2020, there were 4,341,614 shares available for future grant under our Long-Term Incentive Plan ("LTIP"), which is shareholder approved.

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

	2020	2019	2018
Before-tax share-based compensation cost	**$55.8**	$41.2	$38.8
Income tax benefit	**(13.0)**	(9.7)	(9.1)
After-tax share-based compensation cost	**$42.8**	$31.5	$29.7

Before-tax share-based compensation cost is primarily included in "Selling and administrative expense" on our consolidated income statements. The amount of share-based compensation cost capitalized in fiscal years 2020, 2019, and 2018 was not material.

Before-tax share-based compensation cost by type of program was as follows:

	2020	2019	2018
Deferred stock units	**$55.8**	$41.1	$38.3
Stock options	**—**	—	0.2
Restricted stock	**—**	0.1	0.3
Before-tax share-based compensation cost	**$55.8**	$41.2	$38.8

Deferred Stock Units

We have granted deferred stock units to executives, selected employees, and outside directors. These deferred stock units entitle the recipient to one share of common stock upon vesting, which is conditioned, for employee recipients, on continued employment during the deferral period and may be conditioned on achieving certain performance targets. We grant deferred stock unit awards with a two- to five-year deferral period that is subject to payout upon death, disability, or retirement. Deferred stock units issued to outside directors are paid after service on the Board of Directors ends at the time elected by the director (not to exceed 10 years after service ends). We generally expense the grant-date fair value of these awards on a straight-line basis over the vesting period; however, expense recognition is accelerated for retirement eligible individuals who meet the requirements for vesting upon retirement. We have elected to account for forfeitures as they occur, rather than to estimate them. Forfeitures have not been significant historically.

Market-based deferred stock units vest as long as the employee continues to be employed by the Company and upon the achievement of the performance target. The performance target, which is approved by the Compensation Committee, is our share price appreciation and dividends paid, or "total shareholder return," in relation to a defined peer group over a three-year performance period beginning 1 October of the fiscal year of grant. We granted 80,215, 114,929, and 105,268 market-based deferred stock units in fiscal years 2020, 2019, and 2018, respectively.

The fair value of market-based deferred stock units was estimated using a Monte Carlo simulation model as these equity awards are tied to a market condition. 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 estimated grant-date fair value of market-based deferred stock units was $275.19, $229.61, and $202.50 per unit in fiscal years 2020, 2019, and 2018, respectively. The calculation of the fair value of these market-based deferred stock units used the following assumptions:

	2020	2019	2018
Expected volatility	**17.8 %**	17.5 %	18.7 %
Risk-free interest rate	**1.6 %**	2.8 %	1.9 %
Expected dividend yield	**2.4 %**	2.6 %	2.6 %

In addition, we granted 123,448 time-based deferred stock units at a weighted average grant-date fair value of $230.92. In fiscal years 2019 and 2018, we granted 169,666 and 143,379 time-based deferred stock units at a weighted average grant-date fair value of and $168.68 and $162.11, respectively.

A summary of deferred stock unit activity in fiscal year 2020 is presented below:

	Shares (000)	Weighted Average Grant-Date Fair Value
Deferred stock units outstanding at 30 September 2019	976	$156.31
Granted	203	252.53
Paid out	(300)	141.08
Forfeited/adjustments	47	131.35
Deferred stock units outstanding at 30 September 2020	**926**	**$181.14**

Cash payments made for deferred stock units totaled $4.8, $1.9, and $2.2 in fiscal years 2020, 2019, and 2018, respectively. As of 30 September 2020, there was $52.7 of unrecognized compensation cost related to deferred stock units. This cost is expected to be recognized over a weighted average period of 2.0 years. The total fair value of deferred stock units paid out during fiscal years 2020, 2019, and 2018, including shares vested in prior periods, was $65.4, $19.2, and $38.5, respectively.

Stock Options

We have granted awards of options to purchase common stock to executives and selected employees. The exercise price of stock options equals the market price of our stock on the date of the grant. Options generally vest incrementally over three years and remain exercisable for ten years from the date of grant. We have not issued stock option awards since fiscal year 2015. As of 30 September 2020, there was no unrecognized compensation cost as all stock option awards were fully vested.

A summary of stock option activity in fiscal year 2020 is presented below:

	Shares (000)	Weighted Average Exercise Price
Stock options outstanding and exercisable at 30 September 2019	1,344	$93.75
Exercised	(403)	86.28
Forfeited	—	—
Stock options outstanding and exercisable at 30 September 2020	**941**	**$96.95**

The weighted average remaining contractual term of stock options outstanding and exercisable at 30 September 2020 was 2.7 years. The aggregate intrinsic value of these stock options was $189, which represents the amount by which our closing stock price of $297.86 as of 30 September 2020 exceeds the exercise price multiplied by the number of in-the-money options outstanding or exercisable. The intrinsic value of stock options exercised during fiscal years 2020, 2019, and 2018 was $65.7, $87.2, and $90.4, respectively.

Compensation cost is generally recognized over the stated vesting period consistent with the terms of the arrangement, which is either on a straight-line or graded-vesting basis. Expense recognition is accelerated for retirement-eligible individuals who would meet the requirements for vesting of awards upon their retirement.

Cash received from option exercises during fiscal year 2020 was $34.1. The total tax benefit realized from stock option exercises in fiscal year 2020 was $15.4, of which $14.2 was the excess tax benefit.

Restricted Stock

The grant-date fair value of restricted stock is estimated on the date of grant based on the closing price of the stock, and compensation cost is generally amortized to expense on a straight-line basis over the vesting period during which employees perform related services. Expense recognition is accelerated for retirement-eligible individuals who would meet the requirements for vesting of awards upon their retirement. We have elected to account for forfeitures as they occur rather than to estimate them. Historically, forfeitures have not been significant.

We have issued shares of restricted stock to certain officers. Participants are entitled to cash dividends and to vote their respective shares. Restrictions on shares lift in one to four years or upon the earlier of retirement, death, or disability. The shares are nontransferable while subject to forfeiture.

A summary of restricted stock activity in fiscal year 2020 is presented below:

	Shares (000)	Weighted Average Grant-Date Fair Value
Restricted stock outstanding at 30 September 2019	26	$138.00
Vested	(26)	138.00
Restricted stock outstanding at 30 September 2020	**—**	**$—**

As of 30 September 2020, there was no unrecognized compensation cost as all restricted stock awards were fully vested. The total fair value of restricted stock vested during fiscal years 2020, 2019, and 2018 was $6.1, $2.6, and $2.2, respectively.

20. ACCUMULATED OTHER COMPREHENSIVE LOSS

The table below summarizes changes in accumulated other comprehensive loss ("AOCL"), net of tax, attributable to Air Products:

	Derivatives qualifying as hedges	Foreign currency translation adjustments	Pension and postretirement benefits	Total
Balance at 30 September 2017	**($53.1)**	**($787.1)**	**($1,007.2)**	**($1,847.4)**
Other comprehensive income (loss) before reclassifications	45.9	(244.6)	179.4	(19.3)
Amounts reclassified from AOCL	(30.4)	3.1	133.1	105.8
Net current period other comprehensive income (loss)	$15.5	($241.5)	$312.5	$86.5
Amount attributable to noncontrolling interests	—	(18.8)	(0.2)	(19.0)
Balance at 30 September 2018	**($37.6)**	**($1,009.8)**	**($694.5)**	**($1,741.9)**
Other comprehensive loss before reclassifications	(44.1)	(356.2)	(326.2)	(726.5)
Amounts reclassified from AOCL	12.3	(2.6)	63.2	72.9
Net current period other comprehensive loss	($31.8)	($358.8)	($263.0)	($653.6)
Amount attributable to noncontrolling interest	(8.0)	(11.7)	(0.2)	(19.9)
Balance at 30 September 2019	**($61.4)**	**($1,356.9)**	**($957.3)**	**($2,375.6)**
Other comprehensive income (loss) before reclassifications	43.5	233.4	(68.2)	208.7
Amounts reclassified from AOCL	(57.7)	—	82.5	24.8
Net current period other comprehensive income (loss)	($14.2)	$233.4	$14.3	$233.5
Amount attributable to noncontrolling interest	(21.1)	19.3	(0.2)	(2.0)
Balance at 30 September 2020	**($54.5)**	**($1,142.8)**	**($942.8)**	**($2,140.1)**

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

Year Ended 30 September	**2020**	2019	2018
(Gain) Loss on Cash Flow Hedges, net of tax			
Sales/Cost of sales	**($1.0)**	$0.6	$7.1
Other income (expense), net	**—**	(3.0)	(42.6)
Interest expense	**2.8**	14.7	5.1
Other non-operating income (expense), net[(A)]	**(59.5)**	—	—
Total (Gain) Loss on Cash Flow Hedges, net of tax	**($57.7)**	$12.3	($30.4)
Currency Translation Adjustment[(B)]	**$—**	($2.6)	$3.1
Pension and Postretirement Benefits, net of tax[(C)]	**$82.5**	$63.2	$133.1

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

(B) The fiscal year 2019 impact relates to a net gain on the exchange of two equity affiliates with a joint venture partner. Refer to Note 3, *Acquisitions*, for additional information. The fiscal year 2018 impact relates to an equipment sale resulting from the termination of a contract in the Industrial Gases – Asia segment during the first quarter.

(C) 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 16, *Retirement Benefits*, for additional information.

21. EARNINGS PER SHARE

The table below details the computation of basic and diluted earnings per share ("EPS"):

Year Ended 30 September	2020	2019	2018
Numerator			
Net income from continuing operations	**$1,901.0**	$1,760.0	$1,455.6
Net (loss) income from discontinued operations	**(14.3)**	—	42.2
Net Income Attributable to Air Products	**$1,886.7**	$1,760.0	$1,497.8
Denominator (in millions)			
Weighted average common shares — Basic	**221.2**	220.3	219.3
Effect of dilutive securities			
Employee stock option and other award plans	**1.1**	1.3	1.5
Weighted average common shares — Diluted	**222.3**	221.6	220.8
Per Share Data*			
Basic EPS from continuing operations	**$8.59**	$7.99	$6.64
Basic EPS from discontinued operations	**(0.06)**	—	0.19
Basic EPS Attributable to Air Products	**$8.53**	$7.99	$6.83
Diluted EPS from continuing operations	**$8.55**	$7.94	$6.59
Diluted EPS from discontinued operations	**(0.06)**	—	0.19
Diluted EPS Attributable to Air Products	**$8.49**	$7.94	$6.78

*EPS is calculated independently for each component and may not sum to total EPS due to rounding.

Diluted EPS attributable to Air Products reflects the potential dilution that could occur if stock options or other share-based awards were exercised or converted into common stock. The dilutive effect is computed using the treasury stock method, which assumes all share-based awards are exercised, and the hypothetical proceeds from exercise are used by the Company to purchase common stock at the average market price during the period. To the extent they would have been dilutive, the incremental shares, or the difference between shares assumed to be issued versus purchased, are included in the denominator of the diluted EPS calculation. There were no antidilutive outstanding share-based awards in fiscal years 2020 and 2019. Outstanding share-based awards of 0.1 million shares were antidilutive and therefore excluded from the computation of diluted EPS for fiscal year 2018.

22. INCOME TAXES

The following table summarizes the income of U.S. and foreign operations before taxes:

	2020	2019	2018
United States income	**$943.7**	$723.3	$688.5
Foreign income	**1,215.3**	1,350.8	1,151.7
Equity affiliates' income	**264.8**	215.4	174.8
Income from Continuing Operations Before Taxes	**$2,423.8**	$2,289.5	$2,015.0

On 22 December 2017, the United States enacted the U.S. Tax Cuts and Jobs Act (the “Tax Act” or "Tax Reform"), which significantly changed existing U.S. tax laws, including a reduction in the federal corporate income tax rate from 35% to 21%, a deemed repatriation tax on unremitted foreign earnings, as well as other changes. Our consolidated income statements reflect a discrete net income tax expense of $43.8 and $180.6 in fiscal years 2019 and 2018, respectively, related to impacts of the Tax Act.

In fiscal year 2019, our income tax expense reflects 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 $12.4 to reduce the total expected costs of the deemed repatriation tax. The non-recurring benefit recorded in fiscal year 2018 was eliminated by regulations issued in fiscal year 2019.

In fiscal year 2018, our consolidated income statements reflect a discrete net income tax expense of $180.6 and a $28.5 reduction to equity affiliates' income for the impacts of the Tax Act. The income tax expense of $180.6 included a cost of $392.4, which included $322.1 for the deemed repatriation tax and $70.3 primarily for additional foreign taxes on the repatriation of foreign earnings. This cost was partially offset by a $211.8 benefit primarily from the re-measurement of our net U.S. deferred tax liabilities at the lower corporate tax rate. The deemed repatriation tax of $322.1 included the $56.2 non-recurring benefit related to the U.S. taxation of deemed foreign dividends that was eliminated in 2019. We have historically asserted our intention to indefinitely reinvest foreign earnings in certain foreign subsidiaries. We reevaluated our historic assertions as a result of enactment of the Tax Act and adjusted our position relative to the indefinitely reinvested earnings of various foreign subsidiaries. The impact of these changes is included in the $70.3 for additional foreign taxes on the repatriation of foreign earnings recorded in fiscal year 2018.

As of 30 September 2020, the remaining balance of the deemed repatriation tax obligation is $211.4, $190.9 of which is presented on our consolidated balance sheets in noncurrent liabilities. We are paying the obligation in installments over six remaining years.

While our accounting for the provisions of the Tax Act is not provisional, further adjustments to the deemed repatriation tax could result from future U.S. or foreign tax examinations of the years impacted by the calculation or from the issuance of additional federal or state guidance.

As a fiscal year-end taxpayer, certain provisions of the Tax Act became effective in our fiscal year 2018 while other provisions did not become effective until fiscal year 2019. The corporate tax rate reduction was effective as of 1 January 2018 and, accordingly, reduced our 2018 fiscal year U.S. federal statutory rate to a blended rate of approximately 24.5%. The 21.0% federal tax rate applied to our fiscal year ended 30 September 2019 and each year thereafter.

The following table details the components of the provision for income taxes:

	2020	2019	2018
Current Tax Provision			
Federal	**$26.9**	$163.7	$305.1
State	**23.8**	23.3	17.7
Foreign	**262.7**	235.5	256.9
Total Current Tax Provision	**313.4**	422.5	579.7
Deferred Tax Provision			
Federal	**108.8**	9.7	(121.7)
State	**(3.6)**	2.4	12.5
Foreign	**59.8**	45.5	53.8
Total Deferred Tax Provision	**165.0**	57.6	(55.4)
Total Income Tax Provision	**$478.4**	$480.1	$524.3

Total company income tax payments, net of refunds, were $379.9, $324.3, and $372.0 in fiscal years 2020, 2019, and 2018, respectively.

The effective tax rate equals the income tax provision divided by income from continuing operations before taxes. A reconciliation of the differences between the United States federal statutory tax rate and the effective tax rate is as follows:

(Percent of income before taxes)	**2020**	2019	2018
U.S. federal statutory tax rate	**21.0 %**	21.0 %	24.5 %
State taxes, net of federal benefit	**0.6**	1.0	1.0
Income from equity affiliates	**(2.3)**	(2.0)	(2.1)
Foreign tax differentials	**0.1**	1.0	(1.0)
Tax on foreign repatriated earnings	**0.9**	0.1	(0.4)
Share-based compensation	**(0.8)**	(0.6)	(1.0)
Tax reform repatriation	**—**	1.9	19.5
Tax reform rate change and other	**—**	—	(11.1)
Tax restructuring benefit	**—**	—	(1.8)
Domestic production activities	**—**	—	(0.4)
Other	**0.2**	(1.4)	(1.2)
Effective Tax Rate	**19.7 %**	21.0 %	26.0 %

Foreign tax differentials represent the differences between foreign earnings subject to foreign tax rates that are different than the U.S. federal statutory rate and include tax holidays and incentives. As a result of the Tax Act, our effective non-U.S. tax rates in fiscal years 2020 and 2019 are higher than our statutory rate of 21.0% in those years. Our income tax holidays relate to operations in jurisdictions that provide reduced income tax rates for certain qualifying activities and are conditional upon us meeting certain operating thresholds. The impact of these tax holidays decreased income tax expense by $26.9 ($0.12 per share) in fiscal year 2020, primarily related to a preferential tax rate in China that is effective until 31 December 2030. This includes the impact of remeasurement of the deferred tax assets and liabilities due to an extension of the holiday period in China. The impact of tax holidays in fiscal years 2019 and 2018 were not material.

Tax on foreign repatriated earnings includes benefits and costs related to U.S. and additional foreign taxation on the current and future repatriation of foreign earnings and a U.S. benefit for related foreign tax credits. The enactment of the India Finance Act 2020, increased income tax expense by $20.3 and increased equity affiliate income by $33.8 for changes in the future tax costs of repatriated earnings. In addition, the Tax Act included new provisions related to the taxation of foreign operations, known as Global Intangible Low Tax Income (“GILTI”). We have elected as an accounting policy to account for GILTI as a period cost when incurred. This and various other provisions of the Tax Act did not become effective until fiscal year 2019 and did not impact our tax provision in fiscal year 2018.

The Tax Act repealed the domestic production activities deduction, effective for our fiscal 2019 tax year.

Share-based compensation reflects the impact from recognition of $20.0, $14.6, and $21.5 of excess tax benefits in our provision for income taxes during fiscal years 2020, 2019, and 2018, respectively.

In fiscal year 2018, we recognized a tax benefit of $35.7, net of reserves for uncertain tax positions, and a corresponding decrease to net deferred tax liabilities resulting from the restructuring of several foreign subsidiaries.

The significant components of deferred tax assets and liabilities are as follows:

30 September	2020	2019
Gross Deferred Tax Assets		
Retirement benefits and compensation accruals	**$209.0**	$227.1
Tax loss carryforwards	**112.6**	140.6
Tax credits and other tax carryforwards	**40.3**	31.1
Reserves and accruals	**67.0**	69.6
Currency losses	**30.4**	—
Other	**64.6**	57.7
Valuation allowance	**(95.0)**	(92.1)
Deferred Tax Assets	**428.9**	434.0
Gross Deferred Tax Liabilities		
Plant and equipment	**1,110.9**	954.6
Currency gains	**—**	23.9
Unremitted earnings of foreign entities	**58.7**	31.0
Partnership and other investments	**19.3**	14.8
Intangible assets	**83.6**	80.0
Other	**3.9**	8.3
Deferred Tax Liabilities	**1,276.4**	1,112.6
Net Deferred Income Tax Liability	**$847.5**	$678.6

Deferred tax assets and liabilities are included within the consolidated balance sheets as follows:

	2020	2019
Deferred Tax Assets		
Other noncurrent assets	**$115.1**	$115.2
Deferred Tax Liabilities		
Deferred income taxes	**962.6**	793.8
Net Deferred Income Tax Liability	**$847.5**	$678.6

Deferred tax liabilities related to plant and equipment increased due to the impact of accelerated tax depreciation deductions in excess of book depreciation primarily in the United States. The deferred tax component for currency transactions moved into an overall deferred tax asset position due primarily to currency movements on hedging transactions as several foreign based currencies strengthened against the U.S. dollar in fiscal year 2020. We also realized a deferred tax liability related to the unrealized foreign exchange gain for a euro denominated financial instrument. Unremitted earnings of foreign entities increased primarily as a result of the enactment of the India Finance Act 2020 which increased the future tax costs of repatriated earnings.

As of 30 September 2020, we had the following deferred tax assets for certain tax credits:

Jurisdiction	Gross Tax Asset	Expiration Period
U.S. State	$2.0	2021 - 2034
U.S. Federal	14.1	2027 - 2030
Foreign	28.6	2021 - 2025; Indefinite

Of the $28.6 foreign tax credits, $13.3 have indefinite carryforward periods.

As of 30 September 2020, we had the following loss carryforwards:

Jurisdiction	Gross Loss Carryforward	Expiration Period
U.S. State Net Operating Loss	$323.2	2021 - 2040
U.S. Federal Capital Loss	24.4	2025
Foreign Net Operating Loss	236.6	2021 - 2030; Indefinite
Foreign Capital Loss	274.8	Indefinite

In fiscal year 2020, the U.S. Federal capital losses increased by $22.6 primarily due to the recognition of a capital loss for the liquidation of a foreign subsidiary. Of the $236.6 of foreign net operating loss carryforwards, $83.1 have indefinite carryforward periods. Foreign net operating losses decreased by $116.0 in fiscal year 2020 primarily due to utilization in China and a tax election in India that reduced tax loss carryforwards and decreased plant and equipment net deferred tax liabilities.

The valuation allowance was $95.0 and $92.1 as of 30 September 2020 and 2019, respectively. As of 30 September 2020, the balance primarily related to $40.3 of foreign credits and loss carryforwards as well as $52.2 related to foreign capital losses that were generated from the loss recorded on the exit from the Energy-from-Waste project in 2016. If events warrant the reversal of the valuation allowance, it would result in a reduction of tax expense. We believe it is more likely than not that future earnings and reversal of deferred tax liabilities will be sufficient to utilize our deferred tax assets, net of existing valuation allowance, as of 30 September 2020.

As a result of the Tax Act, we recorded $373.2 of federal income tax from the deemed repatriation tax on approximately $5.8 billion of previously undistributed earnings from our foreign subsidiaries and corporate joint ventures. These earnings are now eligible to be repatriated to the U.S. with reduced U.S. tax impacts. However, such earnings may be subject to foreign withholding and other taxes. We record foreign and U.S. income taxes on the undistributed earnings of our foreign subsidiaries and corporate joint ventures unless those earnings are indefinitely reinvested. The cumulative undistributed earnings that are considered to be indefinitely reinvested in foreign subsidiaries and corporate joint ventures are included in retained earnings on the consolidated balance sheets and amounted to $4.7 billion as of 30 September 2020. An estimated $454.4 in additional foreign withholding and other income taxes would be due if these earnings were remitted as dividends.

A reconciliation of the beginning and ending amount of the unrecognized tax benefits is as follows:

	2020	2019	2018
Unrecognized tax benefits balance at beginning of year	**$231.7**	$233.6	$146.4
Additions for tax positions of the current year	**7.6**	7.8	26.4
Additions for tax positions of prior years	**17.7**	14.2	119.2
Reductions for tax positions of prior years	**(4.1)**	(14.7)	(41.3)
Settlements	**(1.2)**	(1.5)	(14.2)
Statute of limitations expiration	**(14.0)**	(3.9)	(2.6)
Foreign currency translation	**(0.7)**	(3.8)	(0.3)
Unrecognized tax benefits balance at end of year	**$237.0**	$231.7	$233.6

As of 30 September 2020 and 2019, we had $237.0 and $231.7 of unrecognized tax benefits, excluding interest and penalties, respectively. Of these benefits, $86.1 and $75.0 as of 30 September 2020 and 2019, respectively, would impact the effective tax rate from continuing operations if recognized.

Interest and penalties related to unrecognized tax benefits are recorded as a component of income tax expense and totaled $6.1, $12.0, and ($2.4) in fiscal years 2020, 2019, and 2018, respectively. Our accrued balance for interest and penalties was $25.2 and $19.5 as of 30 September 2020 and 2019, respectively.

In fiscal year 2018, $119.2 in additions for tax positions of prior years related primarily to uncertain state tax filing positions taken related to the sale of our former Performance Materials Division in fiscal year 2017. Additions for tax positions of the current year in fiscal year 2018 of $26.4 included uncertain tax positions related to the restructuring of foreign subsidiaries and reserves for ongoing transfer pricing uncertainties.

In fiscal year 2018, we received a final audit settlement agreement that resolved uncertainties related to unrecognized tax benefits of $43.1, including interest. This settlement primarily related to tax positions taken in conjunction with the disposition of our Homecare business in 2012. As a result, we recorded an income tax benefit of $25.6, including interest, in income from discontinued operations during 2018. The settlement also resulted in an income tax benefit of approximately $9.1, including interest, in continuing operations for the release of tax reserves on other matters.

We are currently under examination in a number of tax jurisdictions, some of which may be resolved in the next twelve months. As a result, it is reasonably possible that a change in the unrecognized tax benefits may occur during the next twelve months. However, quantification of an estimated range cannot be made as of the date of this report.

We generally remain subject to examination in the following major tax jurisdictions for the years indicated below:

Major Tax Jurisdiction	Open Tax Years
North America	
United States – Federal	2017 - 2020
United States – State	2012 - 2020
Canada	2015 - 2020
Europe	
France	2017 - 2020
Germany	2017 - 2020
Netherlands	2016 - 2020
Spain	2015 - 2020
United Kingdom	2016 - 2020
Asia	
China	2015 - 2020
South Korea	2010 - 2020
Taiwan	2015 - 2020
Latin America	
Chile	2017 - 2020

23. SUPPLEMENTAL INFORMATION

Other Receivables and Current Assets

30 September	2020	2019
Contract assets	**$55.9**	$64.3
Contract fulfillment costs	**109.9**	64.5
Derivative instruments	**97.5**	142.5
Current lease receivables	**86.7**	90.9
Other	**132.9**	115.5
Other receivables and current assets	**$482.9**	$477.7

Other Noncurrent Assets

30 September	2020	2019
Operating lease right-of-use assets	**$376.8**	$—
Deferred tax assets	**115.1**	115.2
Derivative instruments	**45.8**	81.7
Noncurrent customer receivable	**—**	118.0
Prepaid tax	**19.3**	17.0
Pension benefits	**26.5**	28.7
Long-term deposits on plant and equipment	**100.0**	—
Other	**259.6**	243.5
Other noncurrent assets	**$943.1**	$604.1

Payables and Accrued Liabilities

30 September	2020	2019
Trade creditors	**$546.2**	$528.2
Contract liabilities	**313.8**	247.4
Dividends payable	**296.2**	255.7
Accrued payroll and employee benefits	**196.8**	186.1
Obligation for future contribution to an equity affiliate	**94.4**	94.4
Current lease obligations	**70.7**	—
Derivative instruments	**50.9**	91.2
Pension and postretirement benefits	**17.9**	26.0
Other	**246.3**	206.7
Payables and accrued liabilities	**$1,833.2**	$1,635.7

Other Noncurrent Liabilities

30 September	2020	2019
Pension benefits	**$614.2**	$651.2
Postretirement benefits	**31.4**	36.0
Operating lease liabilities[(A)]	**335.8**	—
Asset retirement obligations	**236.2**	201.9
Long-term accrued income taxes related to U.S. tax reform	**190.9**	215.4
Contingencies related to uncertain tax positions	**138.6**	123.3
Environmental liabilities	**73.6**	59.1
Contract liabilities	**57.9**	49.2
Derivative instruments	**34.7**	21.2
Noncurrent customer liability	**—**	118.0
Obligations associated with Energy-from-Waste[(A)]	**—**	57.8
Other	**202.7**	179.3
Other noncurrent liabilities	**$1,916.0**	$1,712.4

[(A)] In connection with our adoption of the new lease guidance, the presentation of our lease liability associated with our former Energy-from-Waste project has been recorded in aggregate with our other operating lease liabilities effective 1 October 2019.

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 fiscal year ended 30 September 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 was reflected as “Facility closure” on our consolidated income statements for the fiscal year ended 30 September 2019 and was not 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 $335, $410, and $360 for the fiscal years ended 30 September 2020, 2019, and 2018, 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. As of 30 September 2020 and 2019, our consolidated balance sheets include related party trade receivables of approximately $95 and $130, respectively.

24. SUMMARY BY QUARTER (UNAUDITED)

The tables below provide unaudited selected financial data and weighted average share information for each quarter of fiscal years 2020 and 2019:

2020	Q1	Q2	Q3	Q4	Total
Sales	$2,254.7	$2,216.3	$2,065.2	$2,320.1	$8,856.3
Gross profit	768.1	756.2	720.3	753.6	2,998.2
Company headquarters relocation income (expense) *(See Note 23)*	—	33.8	—	—	33.8
Operating income	561.0	577.2	539.2	560.2	2,237.6
Equity affiliates' income	58.2	88.2 [(A)]	51.2	67.2	264.8 [(A)]
Income tax provision	120.7	148.5 [(A)]	109.3	99.9	478.4 [(A)]
Income from continuing operations	488.9	504.7	457.1	494.7	1,945.4
Loss from discontinued operations, net of tax *(See Note 6)*	—	(14.3)	—	—	(14.3)
Net income	488.9	490.4	457.1	494.7	1,931.1
Net Income Attributable to Air Products					
Net income from continuing operations	$475.6	$492.1	$446.5	$486.8	$1,901.0
Net loss from discontinued operations	—	(14.3)	—	—	(14.3)
Net Income Attributable to Air Products	$475.6	$477.8	$446.5	$486.8	$1,886.7
Per Share Data*					
Basic EPS from continuing operations	$2.15	$2.22	$2.02	$2.20	$8.59
Basic EPS from discontinued operations	—	(0.06)	—	—	(0.06)
Basic EPS Attributable to Air Products	$2.15	$2.16	$2.02	$2.20	$8.53
Diluted EPS from continuing operations	$2.14	$2.21	$2.01	$2.19	$8.55
Diluted EPS from discontinued operations	—	(0.06)	—	—	(0.06)
Diluted EPS Attributable to Air Products	$2.14	$2.15	$2.01	$2.19	$8.49
Weighted Average Common Shares (in millions)					
Basic	220.9	221.2	221.2	221.3	221.2
Diluted	222.2	222.3	222.4	222.6	222.3
Dividend Information					
Dividends declared per common share	$1.16	$1.34	$1.34	$1.34	$5.18

* EPS is calculated independently for each component and may not sum to total EPS due to rounding.

[(A)] Includes the impact of the enactment of India Finance Act 2020, which increased equity affiliates' income by $33.8 and our income tax provision by $20.3. Refer to Note 22, *Income Taxes*, for additional information.

2019	Q1	Q2	Q3	Q4	Total
Sales	$2,224.0	$2,187.7	$2,224.0	$2,283.2	$8,918.9
Gross profit	651.0 [(A)]	713.0	758.0	792.4	2,914.4 [(A)]
Cost reduction actions *(See Note 5)*	—	—	25.5	—	25.5
Gain on exchange of equity affiliate investments *(See Note 3)*	—	—	29.1	—	29.1
Operating income	455.0	516.5	569.7	603.2	2,144.4
Equity affiliates' income	52.9	46.2	56.4	59.9	215.4
Pension settlement loss *(See Note 16)*	—	5.0	—	—	5.0
Income tax provision	132.1 [(B)]	107.5	109.3 [(B)]	131.2	480.1 [(B)]
Income from continuing operations	357.0	433.5	500.2	518.7	1,809.4
Income from discontinued operations, net of tax	—	—	—	—	—
Net income	357.0	433.5	500.2	518.7	1,809.4
Net Income Attributable to Air Products					
Net income from continuing operations	$347.5	$421.3	$488.0	$503.2	$1,760.0
Net income from discontinued operations	—	—	—	—	—
Net Income Attributable to Air Products	$347.5	$421.3	$488.0	$503.2	$1,760.0
Per Share Data*					
Basic EPS from continuing operations	$1.58	$1.91	$2.21	$2.28	$7.99
Basic EPS from discontinued operations	—	—	—	—	—
Basic EPS Attributable to Air Products	$1.58	$1.91	$2.21	$2.28	$7.99
Diluted EPS from continuing operations	$1.57	$1.90	$2.20	$2.27	$7.94
Diluted EPS from discontinued operations	—	—	—	—	—
Diluted EPS Attributable to Air Products	$1.57	$1.90	$2.20	$2.27	$7.94
Weighted Average Common Shares (in millions)					
Basic	219.9	220.2	220.6	220.7	220.3
Diluted	221.0	221.4	221.9	222.1	221.6
Dividend Information					
Dividends declared per common share	$1.10	$1.16	$1.16	$1.16	$4.58

* EPS is calculated independently for each component and may not sum to total EPS due to rounding.

(A) Includes the impact of a facility closure charge of $29.0 resulting from the government enforced shutdown of a customer in December 2018. Refer to Note 23, *Supplemental Information*, for additional information.

(B) Includes a discrete net income tax expense of $43.8, primarily recorded in the first quarter of fiscal year 2019 to finalize our estimates of the impacts of the U.S. Tax Cuts and Jobs Act. Refer to Note 22, *Income Taxes*, for additional information.

25. BUSINESS SEGMENT AND GEOGRAPHIC 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 segment 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 – Regional

The regional Industrial Gases segments (Americas, EMEA, and Asia) include the results of our regional industrial gas businesses, which produce and sell atmospheric gases, such as oxygen, nitrogen, and argon; process gases, such as hydrogen, helium, carbon dioxide (CO_2), carbon monoxide, and syngas (a mixture of hydrogen and carbon monoxide); and specialty gases. The industrial gases business also develops, builds, and operates equipment for the production or processing of gases, such as air separation units and non-cryogenic generators.

We supply gases to diversified customers in many industries, including those in refining, chemical, gasification, metals, electronics, manufacturing, and food and beverage. We distribute gases to our customers through a variety of supply modes including liquid or gaseous bulk supply delivered by tanker or tube trailer and, for smaller customers, packaged gases delivered in cylinders and dewars or small on-sites (cryogenic or non-cryogenic generators). For large-volume customers, we construct an on-site plant adjacent to or near the customer's facility or deliver product from one of our pipelines.

Electricity is the largest cost component in the production of atmospheric gases. Steam methane reformers utilize natural gas as the primary raw material and gasifiers use liquid and solid hydrocarbons as the principal raw material for the production of hydrogen, carbon monoxide, and syngas. We mitigate energy, natural gas, and hydrocarbon price fluctuations contractually through pricing formulas, surcharges, and cost pass-through and tolling arrangements.

The regional Industrial Gases segments also include our share of the results of several joint ventures accounted for by the equity method. The largest of these joint ventures operate in China, India, Italy, Mexico, Saudi Arabia, South Africa, and Thailand.

Each of the regional Industrial Gases segments competes against global industrial gas companies as well as regional competitors. Competition is based primarily on price, reliability of supply, and the development of industrial gas applications. We derive a competitive advantage in locations where we have pipeline networks, which enable us to provide reliable and economic supply of products to larger customers.

Industrial Gases – Global

The Industrial Gases – Global segment includes activity related to the sale of cryogenic and gas processing equipment for air separation. The equipment is sold worldwide to customers in a variety of industries, including chemical and petrochemical manufacturing, oil and gas recovery and processing, and steel and primary metals processing. The Industrial Gases – Global segment also includes centralized global costs associated with management of all the Industrial Gases segments. These costs include Industrial Gases global administrative costs, product development costs, and research and development costs. We compete with a large number of firms for all the offerings included in the Industrial Gases – Global segment. Competition in the equipment business is based primarily on technological performance, service, technical know-how, price, and performance guarantees.

Corporate and other

The Corporate and other segment includes our liquefied natural gas, turbo machinery equipment and services, and distribution sale of equipment businesses as well as our corporate support functions that benefit all segments. Competition for the sale of equipment businesses is based primarily on technological performance, service, technical know-how, price, and performance guarantees.

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.

In addition to assets of the global businesses included in this segment, other assets include cash, deferred tax assets, and financial instruments.

Customers

We do not have a homogeneous customer base or end market, and no single customer accounts for more than 10% of our consolidated revenues.

Accounting Policies

The accounting policies of the segments are the same as those described in Note 1, *Major Accounting Policies*. We evaluate the performance of segments based upon reported segment operating income.

Business Segment Information

	Industrial Gases–Americas	Industrial Gases–EMEA	Industrial Gases–Asia	Industrial Gases–Global	Corporate and other	Total	
2020							
Sales	$3,630.7	$1,926.3	$2,716.5	$364.9	$217.9	$8,856.3	(A)
Operating income (loss)	1,012.4	473.3	870.3	(40.0)	(112.2)	2,203.8	(B)
Depreciation and amortization	559.5	195.9	399.4	9.6	20.6	1,185.0	
Equity affiliates' income	84.3	74.8	61.0	10.9	—	231.0	(B)
Expenditures for long-lived assets	1,264.7	327.6	690.3	35.3	191.1	2,509.0	
Investments in net assets of and advances to equity affiliates	310.9	535.2	539.7	46.4	—	1,432.2	
Total assets	6,610.1	3,917.0	6,842.9	397.8	7,400.7	25,168.5	
2019							
Sales	$3,873.5	$2,002.5	$2,663.6	$261.0	$118.3	$8,918.9	(A)
Operating income (loss)	997.7	472.4	864.2	(11.7)	(152.8)	2,169.8	(B)
Depreciation and amortization	505.2	189.5	361.5	8.6	18.0	1,082.8	
Equity affiliates' income	84.8	69.0	58.4	3.2	—	215.4	(B)
Expenditures for long-lived assets	545.8	216.3	1,105.5	33.8	88.3	1,989.7	
Investments in net assets of and advances to equity affiliates	301.6	493.4	445.5	35.7	—	1,276.2	
Total assets	5,832.2	3,250.8	6,240.6	325.7	3,293.5	18,942.8	
2018							
Sales	$3,758.8	$2,193.3	$2,458.0	$436.1	$84.0	$8,930.2	(A)
Operating income (loss)	927.9	445.8	689.9	53.9	(176.0)	1,941.5	(B)
Depreciation and amortization	485.3	198.6	265.8	8.1	12.9	970.7	
Equity affiliates' income	82.0	61.1	58.3	1.9	—	203.3	(B)
Expenditures for long-lived assets	546.5	163.1	791.9	17.3	49.6	1,568.4	

(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 reflected as an intersegment sale.

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

Reconciliations to Consolidated Results

Operating Income

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

Year Ended 30 September	2020	2019	2018
Total	**$2,203.8**	$2,169.8	$1,941.5
Change in inventory valuation method	**—**	—	24.1
Facility closure	**—**	(29.0)	—
Cost reduction actions	**—**	(25.5)	—
Gain on exchange of equity affiliate investments	**—**	29.1	—
Company headquarters relocation income (expense)	**33.8**	—	—
Consolidated Operating Income	**$2,237.6**	$2,144.4	$1,965.6

Equity Affiliates' Income

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

Year Ended 30 September	2020	2019	2018
Total	**$231.0**	$215.4	$203.3
India Finance Act 2020	**33.8**	—	—
Tax reform repatriation - equity method investment	**—**	—	(28.5)
Consolidated Equity Affiliates' Income	**$264.8**	$215.4	$174.8

Geographic Information

Sales to External Customers

Year Ended 30 September	2020	2019	2018
United States	**$3,359.6**	$3,351.8	$3,149.6
China	**1,719.7**	1,730.2	1,585.7
Other foreign operations	**3,777.0**	3,836.9	4,194.9
Total	**$8,856.3**	$8,918.9	$8,930.2

Long-Lived Assets[(A)]

30 September	2020	2019	2018
United States	**$4,633.9**	$3,721.3	$3,512.7
China	**3,719.4**	3,302.6	3,066.6
Other foreign operations	**3,611.4**	3,313.7	3,344.4
Total	**$11,964.7**	$10,337.6	$9,923.7

(A) Long-lived assets represents plant and equipment, net.

Geographic information is based on country of origin.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

Not applicable.

Item 9A. 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, our management conducted an evaluation of the effectiveness of our disclosure controls and procedures as of 30 September 2020. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that, as of 30 September 2020, the disclosure controls and procedures were effective.

Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act). Management has evaluated the effectiveness of its internal control over financial reporting as of 30 September 2020 based on criteria established in Internal Control—Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). Based on that evaluation, management concluded that, as of 30 September 2020, our internal control over financial reporting was effective. Management's Report on Internal Control over Financial Reporting is provided under Part II, Item 8, of this Form 10-K.

There was no change in our internal control over financial reporting during the fourth quarter of fiscal year 2020 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Deloitte & Touche LLP, our independent registered public accounting firm, has audited our internal control over financial reporting as of 30 September 2020. The Report of the Independent Registered Public Accounting Firm is provided under Part II, Item 8, of this Form 10-K.

Item 9B. Other Information.

On 19 November 2020, Margaret G. McGlynn informed the Company of her retirement from the Company's Board of Directors, effective 23 November 2020. Ms. McGlynn indicated that her decision to retire was not a result of any disagreement with the Company.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this item relating to our directors and nominees is incorporated herein by reference to the section captioned "The Board of Directors" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021. The information required by this item relating to our executive officers is set forth in Item 1 of Part I of this report.

The information required by this item relating to our Audit and Finance Committee and our Audit and Finance Committee Financial Expert is incorporated herein by reference to the sections captioned "Board Structure–Standing Committees of the Board" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021.

The information required by this item relating to our procedures regarding the consideration of candidates recommended by shareholders and a procedure for submission of such candidates is incorporated herein by reference to the section captioned "The Board of Directors–Selection of Directors" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021.

The information required by the item relating to Section 16(a) Beneficial Ownership Reporting Compliance is incorporated herein by reference to the section captioned "Section 16(a) Beneficial Ownership Reporting" in the Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021.

We have adopted a Code of Conduct that applies to all employees, including the Chief Executive Officer, the Chief Financial Officer, and the Principal Accounting Officer. The Code of Conduct can be found at our website at www.airproducts.com/company/governance/code-of-conduct.

Item 11. Executive Compensation.

The information required by this item is incorporated herein by reference to the sections captioned “Executive Compensation” and “Compensation of Directors” in the Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021.

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

The information required by this item is incorporated herein by reference to the sections captioned "Information About Stock Ownership" and “Equity Compensation Plan Information” in the Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this item is incorporated herein by reference to the sections captioned “The Board of Directors–Director Independence” and “Board Practices, Processes and Policies–Transactions with Related Persons” in the Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021.

Item 14. Principal Accountant Fees and Services.

The information required by this item is incorporated herein by reference to the section captioned “Fees of Independent Registered Public Accounting Firm” in the Proxy Statement for the Annual Meeting of Shareholders to be held on 28 January 2021.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

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

(1) *Financial Statements.* The following is a list of the Consolidated Financial Statements of Air Products and Chemicals, Inc. and its subsidiaries included in Item 8 of Part II of this report:

Report of Deloitte & Touche LLP, Independent Registered Public Accounting Firm 52
Report of KPMG LLP, Independent Registered Public Accounting Firm 55
Consolidated Income Statements – Years Ended 30 September 2020, 2019, and 2018 56
Consolidated Comprehensive Income Statements – Years Ended 30 September 2020, 2019, and 2018 57
Consolidated Balance Sheets – 30 September 2020 and 2019 58
Consolidated Statements of Cash Flows – Years Ended 30 September 2020, 2019, and 2018 59
Consolidated Statements of Equity – Years Ended 30 September 2020, 2019, and 2018 60

(2) *Financial Statement Schedules.* Financial statement schedules are omitted as they are either not required or the information is otherwise included in the consolidated financial statements or notes thereto.

(3) *Exhibits.* The exhibits filed as a part of this report as required by Item 601 of Regulation S-K are listed in the Index to Exhibits located on page 121 of this report.

Item 16. Form 10-K Summary.

None.

INDEX TO EXHIBITS

Exhibit No.	Description
(3)	Articles of Incorporation and Bylaws.
3.1	Restated Certificate of Incorporation of the Company. (Filed as Exhibit 3.2 to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 1987.)*
3.2	Amendment to the Restated Certificate of Incorporation of the Company dated 25 January 1996. (Filed as Exhibit 3.3 to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 1996.)*
3.3	Amendment to the Restated Certificate of Incorporation of the Company dated 28 January 2014. (Filed as Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended 30 June 2014.)*
3.4	Amended and Restated Bylaws of the Company. (Filed as Exhibit 3.1 to the Company's Current Report on Form 8-K dated 26 November 2019.)*
(4)	Instruments defining the rights of security holders, including indentures. Upon request of the Securities and Exchange Commission, the Company hereby undertakes to furnish copies of the instruments with respect to its long-term debt.
4.1	Indenture, dated as of January 10, 1995, between the Company and The Bank of New York Trust, N.A. (formerly Wachovia Bank, National Association and initially First Fidelity Bank Company, National Association), as Trustee. (Filed as Exhibit 4(a) to the Company's Registration Statement on Form S-3 filed January 19, 1995, File No. 033-57357.)*
4.2	Indenture, dated as of April 30, 2020, between the Company and The Bank of New York Trust Company, N.A., as Trustee (Filed as Exhibit 4.1 to the Company's Current Report on Form 8-K filed April 30, 2020).*
4.3	Description of Securities
(10)	Material Contracts
10.1	1990 Deferred Stock Plan of the Company, as amended and restated effective 1 October 1989. (Filed as Exhibit 10.1 to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 1989.)*†
10.2	Annual Incentive Plan as Amended and Restated effective 1 October 2008. (Filed as Exhibit 10.7 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 March 2009.)*†
10.3	Stock Incentive Program of the Company effective 1 October 1996. (Filed as Exhibit 10.21 to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2002.)*†
10.4	Deferred Compensation Program for Directors, effective 7 October 2019. (Filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for quarter ended 31 December 2019.)*†
10.5	Amended and Restated Long-Term Incentive Plan of the Company effective 1 October 2014. (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K filed on 23 September 2014.)*†
10.5(a)	Form of Performance Share Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2019 awards. (Filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 December 2018.)*†
10.5(b)	Form of Performance Share Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2019 awards. (Filed as Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 December 2018.)*†
10.5(c)	Restricted Stock Unit Retention Award Agreement dated 3 December 2018 under the Long-Term Incentive Plan of the Company. (Filed as Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 December 2018.)*†
10.5(d)	Form of Restricted Stock Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2020 awards. (Filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 March 2020.)*†
10.5(e)	Form of Performance Share Award Agreement under the Long-Term Incentive Plan of the Company, used for FY2020 awards. (Filed as Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 March 2020.)*†

INDEX TO EXHIBITS

Exhibit No.	Description
10.6	Air Products and Chemicals, Inc. Retirement Savings Plan as amended and restated effective 1 November 2017 with provisions effective 1 January 2018. (Filed as Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 December 2017.)*†
10.6(a)	Amendment No. 1 to the Air Products and Chemicals, Inc. Retirement Savings Plan as amended and restated effective 1 November 2017 with provisions effective 1 January 2018. (Filed as Exhibit 10.6(a) to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2018). *†
10.6(b)	Amendment No. 2 to the Air Products and Chemicals, Inc. Retirement Savings Plan as amended and restated effective 1 January 2019. (Filed as Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 December 2018.)*†
10.6(c)	Amendment No. 3 to the Air Products and Chemicals, Inc. Retirement Savings Plan as amended and restated effective 1 January 2019. (Filed as Exhibit 10.5 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 December 2018.)*†
10.6(d)	Amendment No. 4 to the Air Products and Chemicals, Inc. Retirement Savings Plan as amended and restated effective 1 August 2019. (Filed as Exhibit 10.6D to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2019.).*†
10.6(e)	Amendment No. 5 to the Air Products and Chemicals, Inc. Retirement Savings Plan as amended and restated effective 1 August 2019. (Filed as Exhibit 10.6E to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2019.)*†
10.7	Supplementary Pension Plan of Air Products and Chemicals, Inc. as Amended and Restated effective August 1, 2014. (Filed as Exhibit 10.10 to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2014.)*†
10.7(a)	Amendment No. 1 dated as of 30 September 2015 to the Supplementary Pension Plan of Air Products and Chemicals, Inc. as Amended and Restated effective 1 August 2014. (Filed as Exhibit 10.10(a) to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2015.)*†
10.7(b)	Amendment No. 2 dated as of 30 September 2016 to the Supplementary Pension Plan of Air Products and Chemicals, Inc. as Amended and Restated effective 1 August 2014. (Filed as Exhibit 10.7(b) to the Company's Annual Report on Form 10-K for fiscal year ended 30 September 2016.)*†
10.7(c)	Amendment No. 3 dated as of 26 July 2017 to the Supplementary Pension Plan of Air Products and Chemicals, Inc. as Amended and Restated effective 1 August 2017.(Filed as Exhibit 10.7(c) to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2017.)*†
10.8	Deferred Compensation Plan as Amended and Restated effective 1 January 2018. (Filed as Exhibit 10.5 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 December 2017.)*†
10.9	Revolving Credit Facility dated as of 31 March 2017 for $2,500,000,000. (Filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 March 2017.)*
10.9(a)	Amendment and Appointment of Successor Administrative Agent dated 28 September 2018 to the Revolving Credit Agreement dated 31 March 2017. (Filed as Exhibit 10.9(a) to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2018.) *
10.10	Air Products and Chemicals, Inc. Executive Separation Program as amended effective as of 20 July 2018. (Filed as Exhibit 10.10 to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2018.)*†
10.11	Form of Change in Control Severance Agreement for an Executive Officer. (filed as Exhibit 10.2 of the Company's Current Report on Form 8-K dated 23 September 2014.)*†
10.12	Compensation Program for Non-Employee Directors effective 1 July 2017. (Filed as Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended 30 June 2017.)*†

INDEX TO EXHIBITS

Exhibit No.	Description
10.13	Air Products and Chemicals, Inc. Corporate Executive Committee Retention Agreements effective as of 10 January 2014. (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K dated 15 January 2014.)*†
10.14	Amended and Restated Employment Agreement dated 14 November 2017, between the Company and Seifollah Ghasemi. (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K filed 14 November 2017.)*†
10.15	Amendment to Employment Agreement, dated May 21, 2020, between Air Products and Chemicals, Inc. and Seifollah Ghasemi. (Filed as Exhibit 10.1 to the Company's Current Report on Form 8-K filed May 21, 2020.)*†
10.16	Senior Management Severance and Summary Plan Description effective as of 1 October 2017. (Filed as Exhibit 10.16 to the Company's Annual Report on Form 10-K for the fiscal year ended 30 September 2017.)*†
10.17	Compensation Programs for Nonemployee Directors effective 26 November 2019. (Filed as Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended 31 December 2019.)*†
(16)	Letter re change in certifying accountant
16.1	Letter from KPMG LLP (Filed as Exhibit 16.1 to the Company's Current Report on Form 8-K dated 26 July 2018).*
21	Subsidiaries of the registrant.
(23)	Consents of Experts and Counsel.
23.1	Consent of Deloitte & Touche LLP, Independent Registered Public Accounting Firm.
23.2	Consent of KPMG LLP, Independent Registered Public Accounting Firm.
24	Power of Attorney.
(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).

* Previously filed as indicated and incorporated herein by reference. Exhibits incorporated by reference are located in SEC File No. 001-04534 unless otherwise indicated.

† Indicated management contract or compensatory arrangement.

†† The certification attached as Exhibit 32.1 that accompanies this Annual Report on Form 10-K, is not deemed filed with the SEC 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-K, irrespective of any general incorporation language contained in such filing.

SIGNATURES

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

AIR PRODUCTS AND CHEMICALS, INC.
(Registrant)

By: /s/ M. Scott Crocco

M. Scott Crocco
Executive Vice President and Chief Financial Officer
(Principal Financial Officer)

Date: 19 November 2020

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

Signature and Title	Date
/s/ Seifi Ghasemi (Seifi Ghasemi) Director, Chairman, President, and Chief Executive Officer (Principal Executive Officer)	19 November 2020
/s/ Russell A. Flugel (Russell A. Flugel) Senior Vice President, Corporate Controller, and Principal Accounting Officer	19 November 2020
* (Susan K. Carter) Director	19 November 2020
* (Charles I. Cogut) Director	19 November 2020
* (Lisa A. Davis) Director	19 November 2020
* (Chad C. Deaton) Director	19 November 2020

Signature and Title	Date
*	19 November 2020
(David H. Y. Ho) Director	
*	19 November 2020
(Margaret G. McGlynn) Director	
*	19 November 2020
(Edward L. Monser) Director	
*	19 November 2020
(Matthew H. Paull) Director	

* Sean D. Major, Executive Vice President, General Counsel and Secretary, by signing his name hereto, does sign this document on behalf of the above noted individuals, pursuant to a power of attorney duly executed by such individuals, which is filed with the Securities and Exchange Commission herewith.

/s/ Sean D. Major

Sean D. Major

Executive Vice President, General Counsel and Secretary

Date: 19 November 2020

Shareholders' information

Common stock information

Ticker Symbol: APD
Exchange Listing: New York Stock Exchange
Transfer Agent and Registrar:
Broadridge Corporate Issuer Solutions, Inc.
P.O. Box 1342
Brentwood, NY 11717
Phone: 844-318-0129
International: 720-358-3595
Fax: 215-553-5402
shareholder.broadridge.com

Publications for shareholders

In addition to this Annual Report and the accompanying Annual Report on Form 10-K, Air Products informs shareholders about Company news through:

Notice of Annual Meeting and Proxy Statement—made available to shareholders in mid-December and posted to the Company's website at investors.airproducts.com/shareholder-info.

Earnings information—shareholders and investors can obtain copies of earnings releases, periodic and current reports, and news releases by visiting investors.airproducts.com. Shareholders and investors can also register for e-mail updates at that website.

Direct investment program

Current shareholders and new investors can conveniently and economically purchase shares of Air Products' common stock and reinvest cash dividends through Broadridge Corporate Issuer Solutions. Registered shareholders can purchase shares on Broadridge Corporate Issuer Solutions, shareholder.broadridge.com/airproducts. New investors can obtain information on the website or by calling:
Phone: 844-318-0129
International: 720-358-3595

Annual meeting

The 2021 annual meeting of shareholders will be held on Thursday, January 28, 2021.

Annual certifications

The most recent certifications by our Chief Executive Officer and Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 are filed as exhibits to our Form 10-K. We have also filed with the New York Stock Exchange the most recent Annual CEO Certification as required by Section 303A.12(a) of the New York Stock Exchange Listed Company Manual.

Additional information

The forward-looking statements contained in this Annual Report are qualified by reference to the section entitled "Forward-Looking Statements" beginning on page 3 of the accompanying Annual Report on Form 10-K.

For more information, please contact us at:

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F 610-481-5900

Corporate Secretary's Office
Sean D. Major, Executive Vice President,
General Counsel and Secretary
T 610-481-4880

Investor Relations Office
Simon Moore, Vice President,
Investor Relations, Corporate Relations
and Sustainability
T 610-481-5775

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