INVESTOR PRESENTATION

June 2019

PQ Corporation

Simpler + STRONGER

LEGAL DISCLAIMER

Forward-Looking Statements

Some of the information contained in this presentation constitutes “forward-looking statements”. Forward-looking statements can be identified by words such as “anticipates,” “intends,” “plans,” “seeks,” “believes,” “estimates,” “expects,” “projects” and similar references to future periods. Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict. Examples of forward looking statements include, but are not limited to, statements regarding our results of operations, financial condition, liquidity, prospects, growth, strategies, product and service offerings and 2019 outlook. Our actual results may differ materially from those contemplated by the forward-looking statements. We caution you, therefore, against relying on any of these forward-looking statements. They are neither statements of historical fact nor guarantees or assurances of future performance. Important factors that could cause actual results to differ materially from those in the forward-looking statements include, but are not limited to, regional, national or global political, economic, business, competitive, market and regulatory conditions, currency exchange rates and other factors, including those described in the sections titled “Risk Factors” and “Management Discussion & Analysis of Financial Condition and Results of Operations” in our filings with the SEC, which are available on the SEC’s website at www.sec.gov. Any forward-looking statement made by us in this presentation, the conference call during which this presentation is reviewed and any discussions that follow speaks only as of the date on which it is made. Factors or events that could cause our actual results to differ may emerge from time to time, and it is not possible for us to predict all of them. We undertake no obligation to update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by applicable law.

Certain supply share statistics included in this presentation, including our estimated supply share positions, are based on management estimates.

Non-GAAP Financial Measures

This presentation includes certain non-GAAP financial measures, including adjusted EBITDA, adjusted EBITDA margin and adjusted free cash flow which are provided to assist in an understanding of our business and its performance. These non-GAAP financial measures should be considered only as supplemental to, and not as superior to, financial measures prepared in accordance with GAAP. Non-GAAP financial measures should be read only in conjunction with consolidated financials prepared in accordance with GAAP. Reconciliations of non-GAAP measures to the relevant GAAP measures are provided in the appendix of this presentation.

The Company is not able to provide a reconciliation of the Company’s non-GAAP financial guidance to the corresponding GAAP measures without unreasonable effort because of the inherent difficulty in forecasting and quantifying certain amounts necessary for such a reconciliation such as certain non-cash, nonrecurring or other items, including transaction and restructuring related items, that are included in net income and EBITDA as well as the related tax impacts of these items and asset dispositions/acquisitions and changes in foreign currency exchange rates that are included in cash flow, due to the uncertainty and variability of the nature and amount of these future charges and costs.

Non-GAAP Financial Measures – Business Combination

On May 4, 2016, we consummated a series of transactions (the "Business Combination") to reorganize and combine the businesses of PQ Holdings Inc. and Eco Services Operations LLC under a new holding company, PQ Group Holdings Inc. In this presentation, we present pro forma information for the years ended December 31, 2016 and 2015, which gives effect to the Business Combination and the related financing transactions as if they occurred on January 1, 2015. Such information is illustrative and not intended to represent what our results of operations would have been had the Business Combination and related financing transactions occurred at any time prior to May 4, 2016 or to project our results of operations for any future period. Such information may not be comparable to, or indicative of, future performance.

Zeolyst Joint Venture

Zeolyst International and Zeolyst C.V. (our 50% owned joint ventures that we refer to collectively as our “Zeolyst Joint Venture”) are accounted for as an equity method investment in accordance with GAAP. The presentation of our Zeolyst Joint Venture’s sales in this presentation represents 50% of the sales of our Zeolyst Joint Venture. We do not record sales by our Zeolyst Joint Venture as revenue and such sales are not consolidated within our results of operations. However, our Adjusted EBITDA reflects our share of the earnings of our Zeolyst Joint Venture that have been recorded as equity in net income from affiliated companies in our consolidated statements of income for such periods and includes Zeolyst Joint Venture adjustments on a proportionate basis based on our 50% ownership interest. Accordingly, our Adjusted EBITDA margins are calculated including 50% of the sales of our Zeolyst Joint Venture for the relevant periods in the denominator.

PQ CORPORATION

Leading and Innovative Global Provider of Specialty Catalysts, Materials and Chemicals and Services

OUR COMPANY

BY THE NUMBERS

6 continents

~200 years in business

~4,000 global customers

~3,200 employees

~70 manufacturing facilities

OVERVIEW

- Founded in 1831
- Headquarters in Malvern, PA
- IPO in September 2017

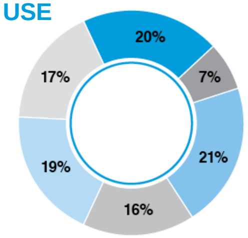
2018 FINANCIAL HIGHLIGHTS

- Revenues: ~ $1.6 Billion
- Adjusted EBITDA: $464 Million
- Adjusted EBITDA Margin: ~ 26%
- Cash from Operations: ~ $250 Million

2018 SALES AND ZEOLYST JV SALES

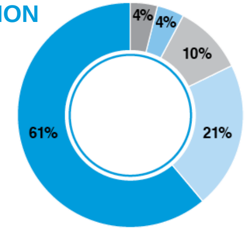
BY REGION AND END USE[1]

END USE



- Packaging & Engineered Plastics
- Industrial & Process Chemicals
- Natural Resources
- Fuels & Emissions Controls
- Consumer Products
- Highway Safety & Construction

REGION



- North America
- South America
- Rest of World
- Asia
- Europe

(1) Sales include proportionate 50% share of sales from Zeolyst joint venture

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OUR BUSINESS UNITS

Specialty, Leading and Differentiated

REFINING SERVICES

Increased octane demand

- Sulfuric acid production expertise
- End-to-end logistics and services

($ MM)	2018
Sales	455.6
Adjusted EBITDA	176.5
Adjusted EBITDA Margin	*38.7%*

- > 50% US supplier of regeneration demand
- > 70% of regeneration contracts under 5 – 10 year take-or-pay terms
- ~90% costs protected with pass-through

CATALYSTS[1]

Tighter fuels standards Light weighting demand

- Tailored catalyst solutions
- Zeolite IP chemistry expertise

($ MM)	2018
Silica Catalyst Sales	72.1
Zeolyst JV Sales	156.7
Adjusted EBITDA	81.1
Adjusted EBITDA Margin[2]	*35.4%*

- Leading catalyst supplier for hydrocracking sulfur removal
- Supplier to top 3 NOx emission control producers
- Specified with top silica licensors & sole supplier to top MMA producer

PERFORMANCE MATERIALS

Higher highway safety standards

- ~100 years glass technology leader
- Innovation in microspheres and thermoplastics technology

($ MM)	2018
Sales	378.3
Adjusted EBITDA	72.5
Adjusted EBITDA Margin	*19.2%*

- Lead bead supplier to NA, Europe, Latin America
- Breadth of supply to diverse end markets
- Pricing and cost protection enabled by transactional volume and diverse customer and market base

PERFORMANCE CHEMICALS

Environmentally driven consumer demand

- Silicate/Zeolite innovation
- Tailored product sizing and coating

($ MM)	2018
Sales	717.3
Adjusted EBITDA	170.9
Adjusted EBITDA Margin	*23.8%*

- Largest global supplier of sodium silicate
- > 70% sales contracted for 1 – 3 year terms
- A large component of our North America material cost protected with pass-through

Leading Furnace Technology / Material Science Capabilities / Global Operational Network

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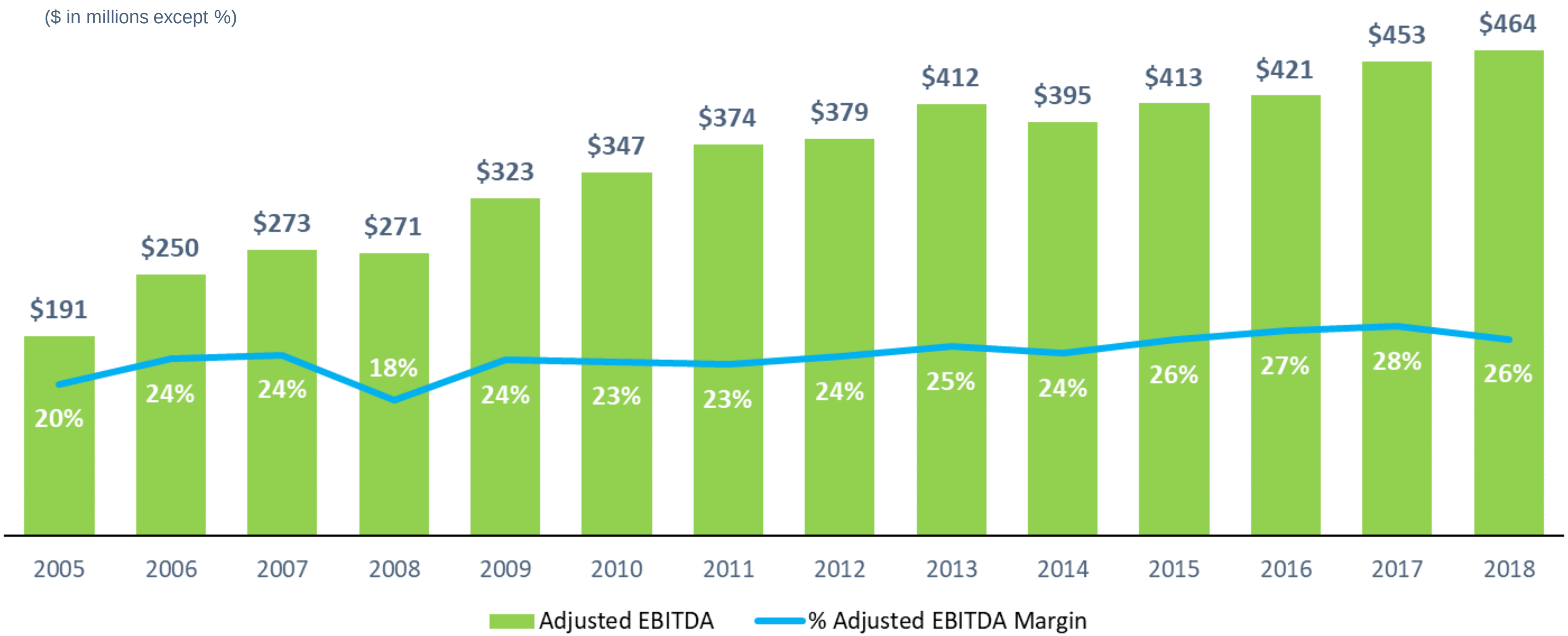
(1) Includes Silica Catalysts and Zeolyst Joint Venture
(2) Adjusted EBITDA margin includes proportionate 50% share of sales from Zeolyst Joint Venture

FINANCIAL PERFORMANCE ACROSS MACROECONOMIC CYCLES

Demonstrated Stability Through Cycles with Attractive Margins

Adjusted EBITDA and Adjusted EBITDA Margin (%)[1,2,3]



(1) Adjusted EBITDA for the period from 2005 to 2014 represents Legacy Eco Adjusted EBITDA and Legacy PQ Adjusted EBITDA prior to the Business Combination. Adjusted EBITDA for 2015 and 2016 is presented on a pro forma basis to give effect to the Business Combination as further described in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017

(2) See Reconciliations for additional information regarding Adjusted EBITDA, including a reconciliation of the amounts to net income (loss) for each of the periods presented as well as information regarding the Legacy Eco and Legacy PQ financial information included in such amounts

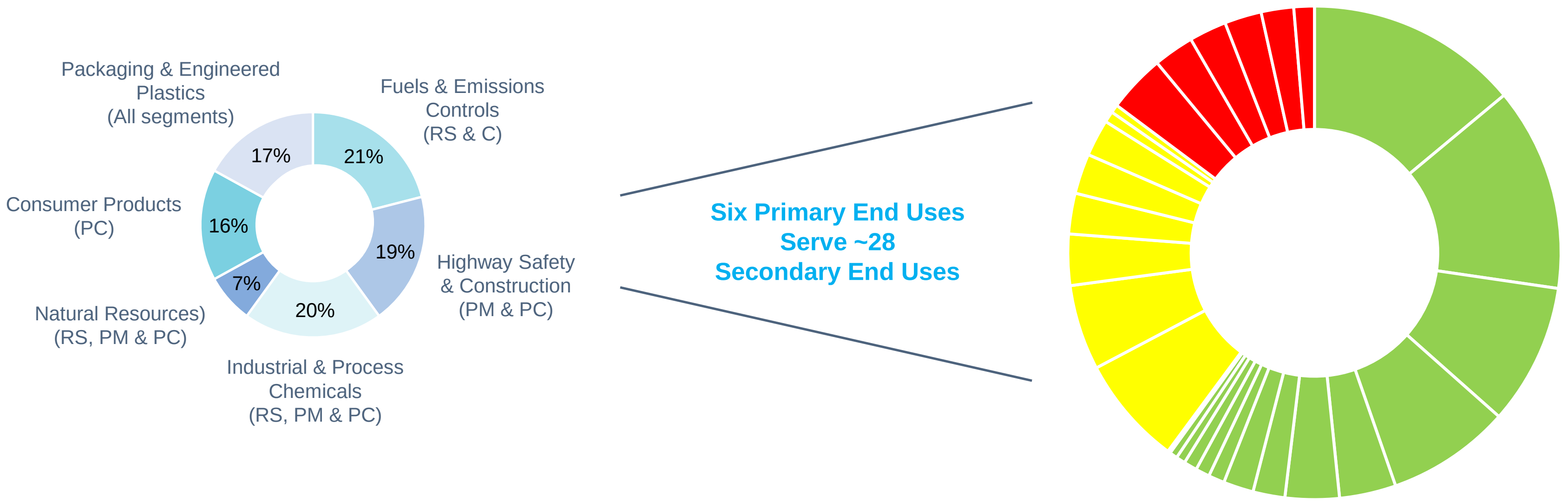
(3) Adjusted EBITDA margin calculation includes proportionate 50% share of sales from Zeolyst Joint Venture

A PORTFOLIO OF STABILITY

Low Exposure to Economic Cycles

% of 2018 Sales by End Use[1]

End Markets Categorized by Sensitivity to Downturn[2]



Sensitivity to Economic Downturn (% of Sales)

Minimal to No Exposure (~ 60%)	Limited Exposure (~25%)	Cyclical Exposure (~15%)
○ Fuels & Emission controls – Driven by gasoline alkylation with 5-10 year contracts and volume minimums ○ Highway Safety – Primarily road striping with 80% replacement business, secure funding ○ Consumer Products – consumer staples (cleaning products, personal care) with steady demand	○ Industrial & Process Chemicals – Diverse end-use applications in general industrial processes & manufacturing ○ Packaging & Engineered Plastics – polymers/plastics for light-weighting of consumer products	○ Construction and Surface Coatings – Furniture, automotive, general construction applications ○ Natural Resources – Paper & pulp, mining, oil drilling

Specific secondary end uses each ~ 1-3% of Sales, not correlated with each other

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(1) Sales includes proportionate 50% share of sales from Zeolyst International joint venture
(2) PQ estimates based on prior historical performance 2015-2018
RS: Refining Services, C: Catalysts, PM; Performance Materials, PC: Performance Chemicals

PORTFOLIO STRENGTHS AND PRIORITIES

Drive Shareholder Value

COMPETITIVE ADVANTAGES

- Unique portfolio of businesses
- Leading positions in secular growth markets
- Innovation potential

EVOLUTION PATHWAYS

- Opportunity Management
- Commercial Intensity
- Time Value of Technology

KEY VALUE DRIVERS

- Profitable Growth
- Capital Efficiency
- Free Cash Flow

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WHY PQ's SPECIALTY CHEMICAL PORTFOLIO?

Investment Highlights

- #1 and #2 positions in nearly all product lines
- GDP+ growth from strong underlying secular macro trends
- Input cost small as % of customer total product cost
- Track record of innovation and customer collaboration
- Environmentally friendly end market applications and solutions
- Stable, high-margins drive strong sustainable free cash flow

SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

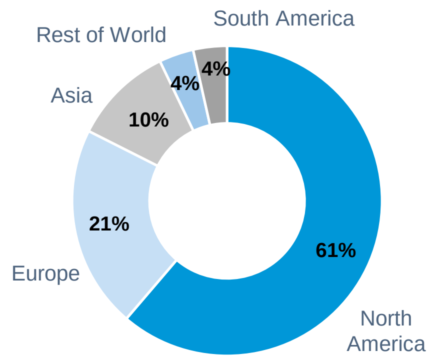
2018 Capital Expenditures, Capitalization, Sales by End Use and Region

CAPITAL EXPENDITURES[1] ($ in millions)	Full Year 2018	Full Year 2017
Maintenance[2]	94.7	102.6
Growth[3]	37.0	37.9
Total	131.7	140.5

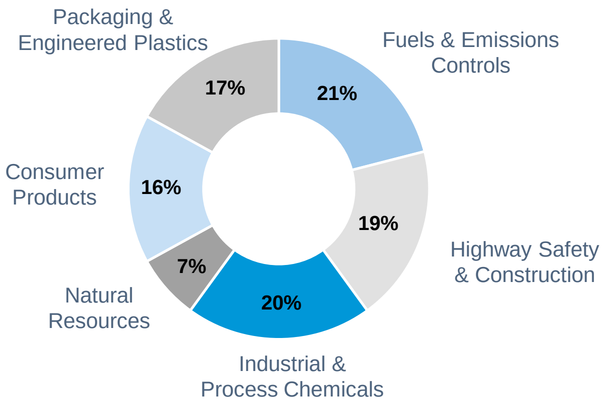
% OF SALES GROWTH BY END USE[4]	
Fuels & Emissions Controls	+ 6%
Highway Safety & Construction	+ 19%
Industrial & Process Chemicals	+ 6%
Natural Resources	+ 16%
Consumer Products	+ 1%
Packaging & Engineered Plastics	+ 13%

CAPITALIZATION	2018
Debt:	**($ in millions)**
ABL Revolving Credit Facility	**—**
USD First Lien Term Loan	**1,157.5**
First Lien Secured Notes	**625.0**
Total First Lien Debt	**1,782.5**
Senior Unsecured Notes	**300.0**
Other debt	**65.9**
Total Debt	**2,148.4**
Cash	**57.9**
Net Debt	**2,090.5**
Net Debt/Adjusted EBITDA	**4.5x**

% SALES BY REGION[4]



% OF SALES BY END USE[4]



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(1) Excludes the Company's proportionate share of capital expenditures from the Zeolyst Joint Venture
(2) Includes Corporate capital expenditures and the cash impact from changes in capital expenditures in accounts payable
(3) Growth capital includes capital used to reduce fixed costs
(4) Sales includes proportionate 50% share of sales from Zeolyst Joint Venture

MACRO INDUSTRY TRENDS

Expected Secular Growth Drivers Across Our Businesses

Turbocharged Engines

+7%

North America CAGR from 2018 – 2025; turbo vehicles rise to ~40% of total NA vehicles in 2025 from ~25% in 2018

Heavy Duty Diesel Emissions

+2x

Global catalyst consumption growth between 2020 – 2025 with China VI implementation

Silicates & Silicas

+2 – 3%

Global CAGR consumption from 2017 – 2022 of sodium silicates and specialty silicas

Hydrocracking

+6%

Global CAGR for capacity expansions from 2018 – 2022 to meet higher standards for lower sulfur in fuels

Transportation Safety

+4%

Global CAGR from 2018 – 2023 for traffic marking paints

Polyethylene

+4 – 5%

Global CAGR from 2017 to 2024 for PE capacity expansions

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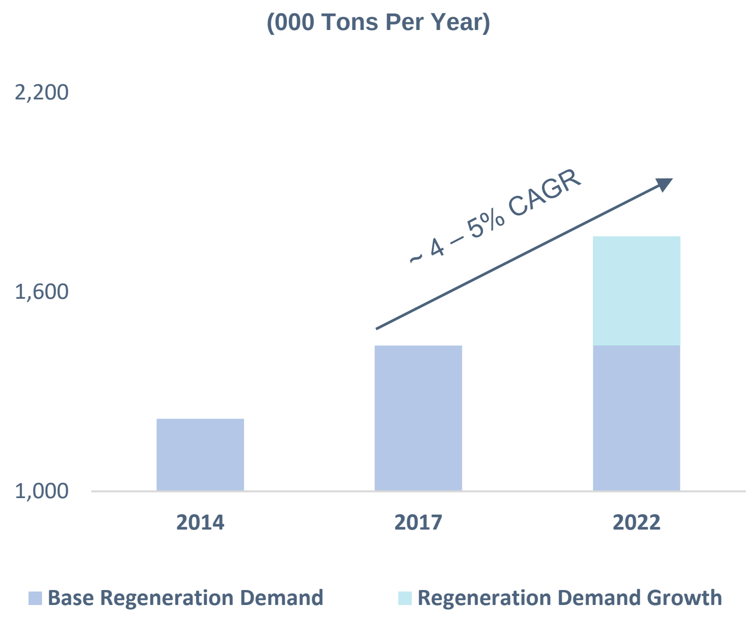
Sources: IHS Markit, IRR, LMC Automotive, BCC Research, and PQ estimates;
Notes: All reflect volume CAGR except for transportation highway; PE reflects HDPE/LLDPE and excludes LDPE
PE: Polyethylene; LLDPE: Linear low-density polyethylene; HDPE: High-density polyethylene; LDPE: Low-density polyethylene

REFINING SERVICES

#1 U.S. Supplier

Strategically Located Network Positioned to Serve New Capacity Expansions in Gulf

Gulf Coast Sulfuric Acid Regeneration Demand



- Planned alkylation expansions, all Gulf Coast, Sulfuric-based
- Expected expansions driven by:
  - Growth in premium share of total gasoline pool (turbocharged engines)
  - Shale oil growth
  - Rising gasoline exports
- PQ debottlenecking expected to accelerate growth rate at high margins

Sources: AFPM (American Fuel Petrochemical Manufacturing), EIA and PQ estimates

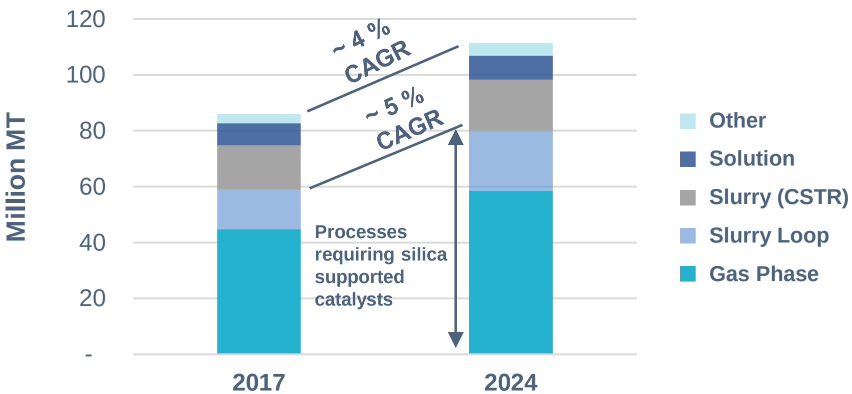
SILICA CATALYSTS – PE and MMA

#2 global supplier of silica catalysts

2019 Expected Growth Steady from PE, with Step-Change from MMA Refill

POLYETHYLENE

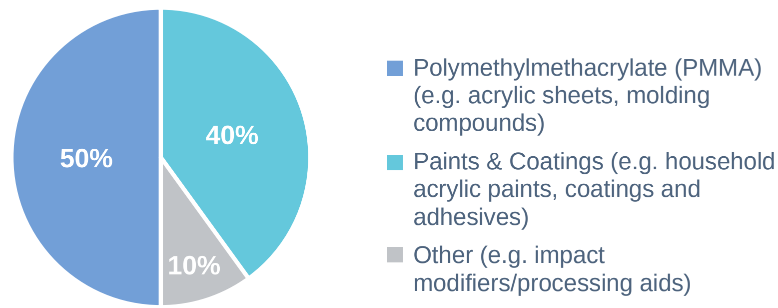
HDPE/LLDPE Projected Capacity Expansions[1]



- PE catalysts demand driven by petrochemical 30 + expected new capacity investments
- ~80% of new capacity would require silica supported catalysts
- Specified supplier to top 3 key licensors of gas phase and slurry loop technology

METHYL METHACRYLATE

Global Consumption End Uses



- Demand from diverse and wide range of end market uses
- Exclusive multi-year all needs supply contract with global MMA leader
- Demand for catalysts driven by timing of customer change-outs

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PE Sources: 2018 IHS CEH Report and PQ estimates; MMA Sources: 2018 IHS Markit, 2016 CEH Report and PQ estimates

1) Excludes low-density polyethylene (LDPE) market; PE consumption by type: HDPE – ~45%, LLDPE - ~32% and LDPE - ~23%

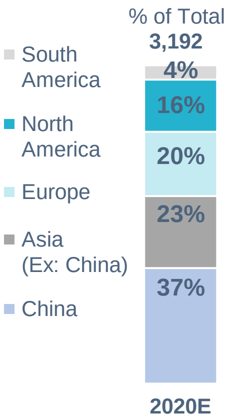
ZEOLYST JV WITH SHELL – FUEL AND EMISSION CONTROL CATALYSTS

Growth from Increased Fuel and Emissions Regulations

#1 global supplier of emission catalysts

Removing NOx from Vehicle Emissions:

Global Mix (000) and Catalyst Consumption for HDD Vehicles

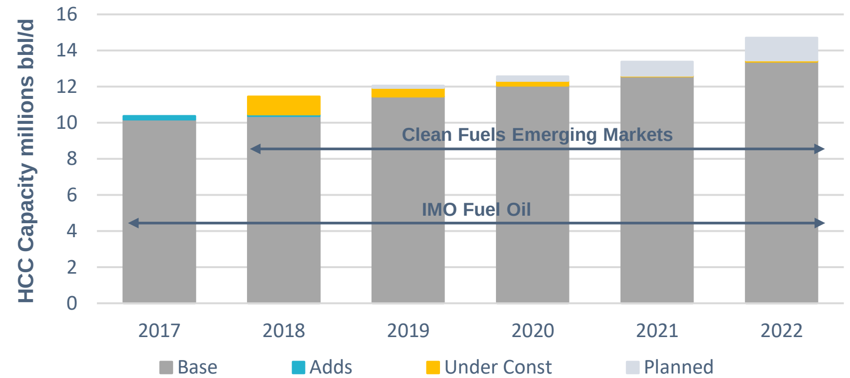


Region	Current Consumption per Vehicle	Estimated Future Standards (2020)	Total 2020E Catalyst Consumption (mm lbs)
U.S.	10 lbs post-2010	10 lbs	~ 4
Europe	10 lbs post-2013	10 lbs	~ 5
China*	0 lbs	10 lbs	~ 12

- **Global environmental standards for Heavy Duty Diesel (HDD) progressively tightening**
  - Increased demand and share for emission control catalysts expected in emerging markets
  - Adoption by China and others expected to accelerate demand
  - China VI implementation in 2020 is projected to double catalyst consumption

Removing Sulfur from Fuels:

Hydrocracking Projected Capacity Expansions



- **Demand growth for low-sulfur fuels drives global planned capacity investments**
  - Increasing compliance by other countries (China, India, Brazil among others) to remove sulfur from on-road vehicles
  - IMO 2020 applies low-sulfur limits to shipping industry
  - Continued growth expected from lower sulfur fuels in Europe and US

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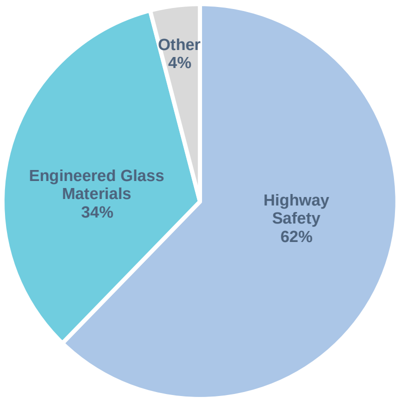
Sources: September 2018 LMC Automotive and PQ Estimates
* China is planning on implementation of European Union equivalent emissions standards effective 2020

PERFORMANCE MATERIALS

#1 global provider of engineered safety beads

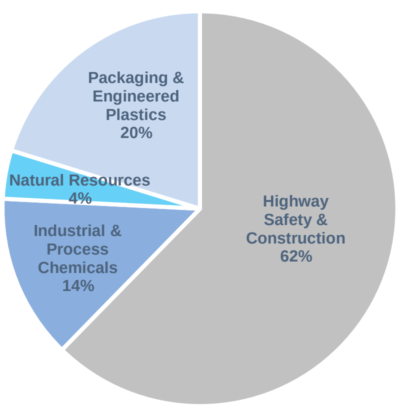
Increased Standards for Transportation Safety Drives Demand

Product Line



- **Lead road marking bead supplier in North America, Europe and Latin America**
- **Broad global network with 28 production facilities**
- **Leading glass technology — 100+ years of innovation and customer solutions for safety and industrial applications**

End Use Demand



- **Upgrades of existing infrastructure for tighter standards for road and worker safety**
- **Reinforces plastics for light weighting products; displaces materials in electronics & other consumables**
- **Substitutes as environmentally friendly for metal finishing abrasives; ingredients for cosmetics**
- **Uses in cementing for oil & gas drill casing**

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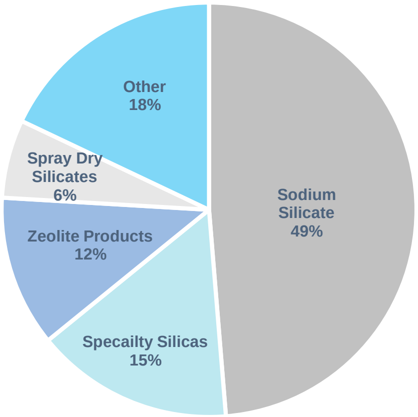
Notes: % calculated based on 2018 Revenues

PERFORMANCE CHEMICALS

#1 North America & Europe silicates supplier

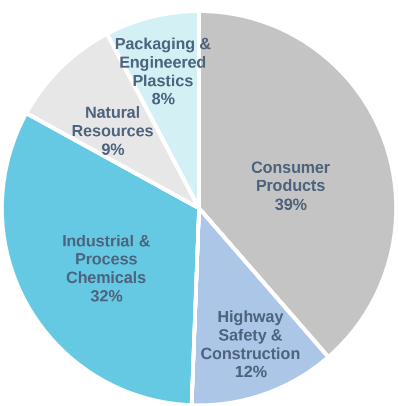
Growing Trends for Environmentally Friendly and Sustainable Products

Product Line



- > 2x sodium silicate supply share of nearest competitor
- ~ 70% contracted sales with 1 – 3 year term; ~ 40% North America raw material contract pass-through
- Leading global network to meet key 50+ year multi-national customer demand

End Use Demand



- Feedstock for silica catalysts; polymers/plastics for packaging, consumer products
- Substitutes as environmentally friendly additives (i.e., detergent, cleaning applications), oral hygiene & facial products
- Uses in specialty coatings
- Replaces other materials as environmentally friendly in tires for rolling resistance and reducing release of lead from aging water pipe lines
- Provides environmentally safer use for drilling fluids in oil & gas production

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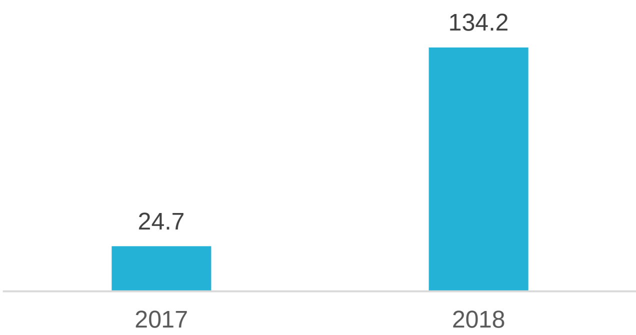
Notes: % calculated based on 2018 Revenues

ADJUSTED FREE CASH FLOW AND LEVERAGE RATIO

Strong Sustainable Adjusted Free Cash Drives Progress towards Leverage Target

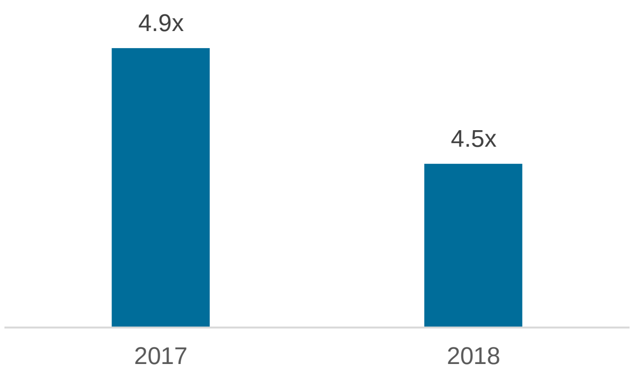
ADJUSTED FREE CASH FLOW ($mm)

All Adjusted Free Cash Flow used to repay debt



NET DEBT/ADJUSTED EBITDA RATIO

Progress to leverage target of 3.0 – 3.5x



- Fixed/floating ratio of 90/10 limits exposure to higher interest rates
  - Interest rate caps extend through July 2022
- Weighted average cost of debt of ~5%
- No near-term maturities; no pre-pay penalty on term loan

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QUARTERLY SALES, ADJUSTED EBITDA & ADJUSTED EBITDA MARGIN

Year 2017 - 2019

($ in millions except %, unaudited)	Three Months Ended March 31, 2019	Three Months Ended March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018	Year Ended December 31, 2018	Three Months Ended March 31, 2017	June 30, 2017	September 30, 2017	December 31, 2017	Year Ended December 31, 2017
Sales:											
Refining Services	105.8	100.7	112.1	123.4	119.4	455.6	94.2	103.9	100.4	99.9	398.4
Silica Catalysts	15.9	16.5	17.3	16.3	22.0	72.1	17.1	20.1	15.1	23.0	75.3
Performance Materials	61.1	62.7	126.5	115.4	73.7	378.3	53.8	99.5	104.4	66.5	324.2
Performance Chemicals	180.5	190.0	183.8	174.7	168.8	717.3	170.9	169.0	175.5	172.2	687.6
Inter-company sales eliminations	(4.1)	(3.7)	(5.0)	(2.6)	(3.8)	(15.1)	(3.1)	(3.2)	(3.6)	(3.5)	(13.4)
Total sales	**359.2**	**366.2**	**434.7**	**427.2**	**380.1**	**1,608.2**	**332.9**	**389.3**	**391.8**	**358.1**	**1,472.1**
Zeolyst Joint Venture net sales	29.5	38.3	49.5	32.3	36.6	156.7	32.7	30.7	37.6	42.8	143.8
Adjusted EBITDA:											
Refining Services	39.7	35.5	41.3	49.6	50.1	176.5	36.5	41.9	40.4	35.4	154.2
Catalysts	18.1	22.9	23.6	15.7	18.9	81.1	19.9	22.4	21.5	25.6	89.4
Performance Materials	10.5	12.1	28.6	21.3	10.5	72.5	9.7	24.1	22.4	13.5	69.7
Performance Chemicals	42.7	45.1	44.8	41.8	39.2	170.9	42.8	42.3	43.5	41.9	170.5
Total Segment Adjusted EBITDA	**111.0**	**115.6**	**138.3**	**128.4**	**118.7**	**501.0**	**108.9**	**130.7**	**127.8**	**116.4**	**483.8**
Corporate	(10.0)	(7.7)	(9.4)	(10.3)	(9.6)	(37.0)	(7.7)	(7.9)	(7.9)	(7.0)	(30.5)
Total Adjusted EBITDA	**101.0**	**107.9**	**128.9**	**118.1**	**109.1**	**464.0**	**101.2**	**122.8**	**119.9**	**109.4**	**453.3**
Adjusted EBITDA Margin:											
Refining Services	37.5%	35.3%	36.8%	40.2%	42.0%	38.7%	38.7%	40.3%	40.2%	35.4%	38.7%
Catalysts[1]	40.0%	41.8%	35.3%	32.3%	32.3%	35.4%	40.0%	44.1%	40.8%	38.9%	40.8%
Performance Materials	17.2%	19.3%	22.6%	18.5%	14.2%	19.2%	18.0%	24.2%	21.5%	20.3%	21.5%
Performance Chemicals	23.7%	23.7%	24.4%	23.9%	23.2%	23.8%	25.0%	25.0%	24.8%	24.3%	24.8%
Total Adjusted EBITDA Margin[1]	**26.0%**	**26.7%**	**26.6%**	**25.7%**	**26.2%**	**26.3%**	**27.7%**	**29.2%**	**27.9%**	**27.3%**	**28.1%**

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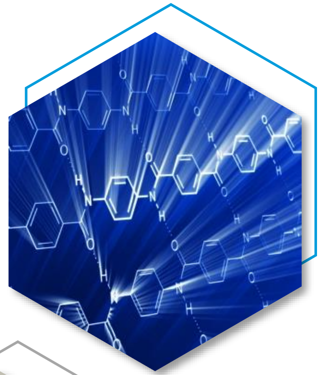
(1) Adjusted EBITDA margin calculation includes proportionate 50% share of net sales from Zeolyst joint venture.

2019 GUIDANCE

Expected Adjusted Free Cash Flow Range of $125 Million to $145 Million

($ in millions except %)	2018 Actual	2019 Outlook
Sales	1,608.2	1,640 – 1,670
Adjusted EBITDA	464.0	470 – 485
Adjusted Free Cash Flow	**134.2**	**125 – 145**
Adjusted Diluted EPS	$0.87	$0.75 - $0.93
Interest Expense	113.7	115 – 120
Depreciation & Amortization		
PQ	185.2	190 – 200
Zeolyst JV	12.6	14 – 16
Capital Expenditures	131.7	140 - 150
Effective Tax Rate (ex tax reform)	23.5%	mid 20%



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Note: Guidance as of First Quarter 2019 earnings conference call on May 9, 2019

RECONCILIATION OF ADJUSTED FREE CASH FLOW

Adjusted Free Cash Flow for Years 2018 and 2017

($ in millions)	Full Year 2018	Full Year 2017
Cash Flow from Operations before interest and tax	**377.5**	**364.5**
Less:		
Cash paid for taxes	**23.8**	**29.2**
Cash paid for interest	**105.1**	**170.1**
Cash Flow from Operations	**248.6**	**165.2**
Less: Purchases of property, plant and equipment[1]	**131.7**	**140.5**
Free Cash Flow	**116.9**	**24.7**
Plus: Proceeds from sale of assets	**12.4**	**—**
Plus: Net interest proceeds on currency swaps	**4.9**	**—**
Adjusted Free Cash Flow	**134.2**	**24.7**

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(1) Excludes the Company's proportionate 50% share of capital expenditures from the Zeolyst joint venture.

RECONCILIATION OF SALES AND ADJUSTED EBITDA

2005 – 2018

($ in millions)	Year Ended December 31, 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015 Pro forma [3]	2016 Pro forma [3]	2017	2018
Reconciliation of sales and adjusted EBITDA														
Legacy PQ Sales [1]	635.3	708.6	775.0	977.0	1,009.9	1,087.9	1,115.0	1,084.8	1,085.0	1,114.9				
Legacy Eco Services Sales [2,5]	260.2	288.7	289.4	449.4	293.9	331.0	415.4	410.4	390.8	397.4				
Total Sales	**895.5**	**997.3**	**1,064.4**	**1,426.4**	**1,303.8**	**1,418.9**	**1,530.4**	**1,495.2**	**1,475.8**	**1,512.3**	**1,413.2**	**1,403.0**	**1,472.1**	**1,608.2**
Zeolyst Joint Venture total net sales	**45.6**	**60.4**	**63.8**	**69.4**	**63.2**	**69.9**	**99.0**	**87.3**	**148.5**	**106.7**	**159.8**	**131.3**	**143.8**	**156.7**
Legacy PQ Adjusted EBITDA[1]	119.6	151.2	177.3	164.3	225.4	253.8	274.6	268.7	306.8	288.1				
Legacy Eco Services Adjusted EBITDA [2]	71.5	99.0	96.0	106.4	97.5	93.6	99.8	110.8	105.5	107.2				
Total Adjusted EBITDA	**191.1**	**250.2**	**273.3**	**270.7**	**322.9**	**347.4**	**374.4**	**379.5**	**412.3**	**395.3**	**413.2**	**420.8**	**453.3**	**464.0**
% Adjusted EBITDA Margin[4]	**20.3%**	**23.7%**	**24.2%**	**18.1%**	**23.6%**	**23.3%**	**23.0%**	**24.0%**	**25.4%**	**24.4%**	**26.3%**	**27.4%**	**28.1%**	**26.3%**

(1) Legacy PQ is the results of PQ Holdings Inc. prior to the Business Combination in May 2016
(2) Legacy Eco Services is the results of Eco Services which prior to December 1, 2014 was part of Solvay / Rhodia. Information for 2005 through 2010 is derived from financial information obtained in connection with the acquisition of Legacy Eco and is unaudited and, in some cases, is based upon management estimates
(3) Reflects unaudited pro forma results which gives effect to the Business Combination
(4) Adjusted EBITDA margin calculation includes proportionate 50% share of sales from Zeolyst Joint Venture
(5) Amounts presented for Legacy Eco Services in 2014 includes $361.8 and $35.5 of sales and $98.1 and $9.1 of Adjusted EBITDA for the predecessor and successor periods, respectively. Refer to reconciliations for additional details.

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RECONCILIATIONS FOR ADJUSTED EBITDA

2005 – 2014 Legacy PQ[1] Net Income (Loss) to Adjusted EBITDA Reconciliation

	Year Ended December 31,									
($ in millions)	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Reconciliation of net income (loss) attributable to Legacy PQ to Adjusted EBITDA										
Net income (loss) attributable to PQ Group Holdings Inc.	(41.9)	14.2	(64.7)	(168.2)	(10.6)	11.5	(65.4)	5.2	26.7	(3.6)
Provision for (benefit from) income taxes	(2.2)	14.0	(29.5)	(28.7)	(12.1)	(4.7)	(0.4)	18.9	10.6	7.5
Interest expense	38.3	51.9	79.5	119.2	117.8	112.9	121.2	111.2	120.3	111.6
Depreciation and amortization	44.6	46.8	57.1	88.6	99.6	96.1	98.0	93.4	89.4	91.3
EBITDA	**38.8**	**126.9**	**42.4**	**10.9**	**194.7**	**215.8**	**153.4**	**228.7**	**247.0**	**206.8**
Joint venture depreciation, amortization and interest	2.4	2.1	2.1	2.3	2.1	2.5	3.2	3.3	6.1	6.9
Amortization of investment in affiliate step-up	6.1	1.2	24.7	4.0	2.7	2.7	2.7	2.6	2.4	2.4
Amortization of inventory step-up	32.7	14.0	22.2	28.3	—	—	—	—	—	—
Impairment of long-lived and intangible assets	—	—	—	—	0.3	4.2	67.0	—	0.9	—
Debt extinguishment costs	—	—	32.6	—	—	—	2.3	20.1	20.3	2.5
Net loss on asset disposals	0.3	0.2	0.7	0.1	1.0	(1.1)	2.2	0.8	0.7	0.7
Foreign currency exchange loss	—	—	1.2	77.0	(26.9)	13.9	5.6	(1.9)	4.4	23.4
Non-cash revaluation of inventory, including LIFO	(0.8)	—	1.7	1.1	7.6	(1.5)	1.5	0.3	1.2	0.8
Management advisory fees	—	2.0	2.0	3.5	5.0	5.0	7.0	7.5	5.0	5.0
Transaction related costs	29.9	0.5	35.8	11.5	0.5	5.5	7.9	0.5	5.6	24.4
Equity-based and other non-cash compensation	0.1	0.1	0.3	0.7	0.2	1.0	0.3	—	1.0	—
Restructuring, integration and business optimization expenses	12.6	4.4	7.3	7.3	11.7	2.6	5.9	5.6	5.4	4.6
Defined benefit plan pension cost	—	—	—	0.6	(0.1)	—	—	0.5	3.6	1.8
Other	(2.5)	(0.2)	4.3	17.0	26.6	3.2	15.6	0.7	3.2	8.8
Adjusted EBITDA	**119.6**	**151.2**	**177.3**	**164.3**	**225.4**	**253.8**	**274.6**	**268.7**	**306.8**	**288.1**

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(1) Legacy PQ is the results of PQ Holdings Inc. prior to the Business Combination in May 2016

RECONCILIATIONS FOR ADJUSTED EBITDA

2005 – 2014 Legacy Eco Services[1] Net Income (Loss) to Adjusted EBITDA Reconciliation

	Year Ended December 31,										
($ in millions)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 Successor	2014 Predecessor
Reconciliation of net income (loss) attributable to Legacy Eco Services to Adjusted EBITDA											
Net income (loss) attributable to PQ Group Holdings Inc.	45.4	73.0	73.8	86.0	73.4	65.4	35.8	48.5	39.3	(22.1)	30.5
Provision for (benefit from) income taxes	—	—	—	—	—	—	20.5	26.3	21.4	—	14.6
Interest expense	—	—	—	—	—	—	0.2	0.2	0.1	8.5	0.1
Depreciation and amortization	26.1	26.0	22.2	20.4	24.1	27.5	30.7	38.8	43.5	3.0	42.5
EBITDA	**71.5**	**99.0**	**96.0**	**106.4**	**97.5**	**92.9**	**87.2**	**113.8**	**104.3**	**(10.6)**	**87.7**
Amortization of inventory step-up	—	—	—	—	—	—	2.1	—	—	3.5	—
Transaction related costs	—	—	—	—	—	—	—	—	—	15.5	—
Equity-based and other non-cash compensation	—	—	—	—	—	—	0.4	0.6	0.7	—	0.5
Restructuring, integration and business optimization expenses	—	—	—	—	—	—	—	—	—	0.2	—
Other	—	—	—	—	—	0.7	10.1	(3.6)	0.5	0.5	9.9
Adjusted EBITDA	**71.5**	**99.0**	**96.0**	**106.4**	**97.5**	**93.6**	**99.8**	**110.8**	**105.5**	**9.1**	**98.1**

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(1) Legacy Eco Services is the results of Eco Services which prior to December 1, 2014 was part of Solvay / Rhodia. Information for 2005 through 2010 is derived from financial information obtained in connection with the acquisition of Legacy Eco and is unaudited and, in some cases, is based upon management estimates.

RECONCILIATIONS FOR ADJUSTED EBITDA

2015 – 2018 Post-Business Combination PQ Net Income (Loss) to Adjusted EBITDA Reconciliation

($ in millions)	Year Ended December 31, 2015 Pro forma [1]	2016 Pro forma [1]	2017	2018
Reconciliation of net income (loss) attributable to PQ Group Holdings Inc. to Segment Adjusted EBITDA				
Net income (loss) attributable to PQ Group Holdings Inc.	(26.9)	(59.0)	57.6	58.3
Provision for (benefit from) income taxes	1.2	58.0	(119.2)	29.0
Interest expense	199.6	187.9	179.0	113.7
Depreciation and amortization	152.2	165.8	177.1	185.2
EBITDA	**326.1**	**352.7**	**294.5**	**386.2**
Joint venture depreciation, amortization and interest [a]	7.9	10.3	11.1	12.6
Amortization of investment in affiliate step-up [b]	6.6	5.8	8.6	6.6
Amortization of inventory step-up [c]	—	4.9	0.9	1.6
Impairment of long-lived and intangible assets	0.4	6.9	—	—
Debt extinguishment costs	—	1.8	61.9	7.8
Net loss on asset disposals [d]	5.5	4.8	5.8	6.6
Foreign currency exchange loss [e]	21.1	(9.0)	25.8	13.8
LIFO expense [f]	(2.1)	1.3	3.7	8.4
Management advisory fees [g]	5.6	5.3	3.8	—
Transaction and other related costs [h]	13.2	2.6	7.4	0.9
Equity-based and other non-cash compensation	4.2	6.5	8.8	19.5
Restructuring, integration and business optimization expenses [i]	8.6	17.9	13.2	14.0
Defined benefit plan pension cost [j]	6.1	2.8	2.9	(0.8)
Transition services	4.9	—	—	—
Gain on contract termination [k]	—	—	—	(20.6)
Other [l]	5.1	6.2	4.9	7.4
Adjusted EBITDA	**413.2**	**420.8**	**453.3**	**464.0**

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(1) Reflects unaudited pro forma results which gives effect to the Business Combination as further described in the company's annual report on Form 10-K for the year ended December 31, 2017

RECONCILATION OF NET INCOME TO SEGMENT ADJUSTED EBITDA

2017 Through First Quarter 2019

($ in millions)	Three Months Ended	Three Months Ended				Year Ended	Three Months Ended				Year Ended
	March 31, 2019	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018	December 31, 2018	March 31, 2017	June 30, 2017	September 30, 2017	December 31, 2017	December 31, 2017
Reconciliation of net income (loss) attributable to PQ Group Holdings Inc. to Segment Adjusted EBITDA											
Net income attributable to PQ Group Holdings Inc.	3.2	0.2	15.8	14.2	28.1	58.3	(2.5)	(1.6)	(3.4)	65.1	57.6
Provision for (benefit from) income taxes	2.4	(0.5)	13.6	8.5	7.4	29.0	(2.9)	3.0	5.2	(124.5)	(119.2)
Interest expense	28.6	29.2	27.2	28.2	29.1	113.7	46.8	48.2	49.1	34.9	179.0
Depreciation and amortization	45.9	48.5	47.0	43.8	45.9	185.2	40.6	42.6	45.9	48.0	177.1
EBITDA	**80.1**	**77.4**	**103.6**	**94.7**	**110.5**	**386.2**	**82.0**	**92.2**	**96.8**	**23.5**	**294.5**
Joint venture depreciation, amortization and interest [a]	3.8	3.3	2.6	3.3	3.4	12.6	2.6	2.9	2.6	3.0	11.1
Amortization of investment in affiliate step-up [b]	2.6	1.7	1.7	1.7	1.5	6.6	3.5	1.7	1.7	1.7	8.6
Amortization of inventory step-up [c]	—	1.6	—	—	—	1.6	0.9	—	—	—	0.9
Debt extinguishment costs	—	5.9	—	0.9	1.0	7.8	—	—	0.5	61.4	61.9
Net loss on asset disposals [d]	0.8	1.2	4.8	5.2	(4.6)	6.6	0.3	2.6	3.5	(0.6)	5.8
Foreign currency exchange (gain) loss [e]	(2.7)	5.1	6.8	3.5	(1.6)	13.8	2.0	14.4	5.3	4.1	25.8
LIFO expense [f]	10.2	4.9	0.1	0.9	2.5	8.4	2.4	—	0.8	0.5	3.7
Management advisory fees [g]	—	—	—	—	—	—	1.3	1.3	1.3	—	3.8
Transaction and other related costs [h]	0.1	0.4	0.3	0.2	—	0.9	1.4	3.0	1.0	2.0	7.4
Equity-based and other non-cash compensation	3.4	3.8	3.8	4.3	7.6	19.5	1.7	1.2	1.0	4.9	8.8
Restructuring, integration and business optimization expenses [i]	0.7	1.1	2.4	2.2	8.3	14.0	1.7	1.4	5.0	5.1	13.2
Defined benefit plan pension cost [j]	1.0	0.6	(0.4)	0.1	(1.1)	(0.8)	0.7	0.7	0.8	0.7	2.9
Gain on contract termination [k]	—	—	—	—	(20.6)	(20.6)	—	—	—	—	—
Other [l]	1.0	0.9	3.2	1.1	2.2	7.4	0.7	1.4	(0.4)	3.1	4.9
Adjusted EBITDA	**101.0**	**107.9**	**128.9**	**118.1**	**109.1**	**464.0**	**101.2**	**122.8**	**119.9**	**109.4**	**453.3**
Unallocated corporate costs	10.0	7.7	9.4	10.3	9.6	37.0	7.7	7.9	7.9	7.0	30.5
Total Segment Adjusted EBITDA[1]	**111.0**	**115.6**	**138.3**	**128.4**	**118.7**	**501.0**	**108.9**	**130.7**	**127.8**	**116.4**	**483.8**

EBITDA Adjustments by Line Item											
EBITDA	**80.1**	**77.4**	**103.6**	**94.7**	**110.5**	**386.2**	**82.0**	**92.2**	**96.8**	**23.5**	**294.5**
Cost of goods sold	10.8	7.3	2.6	2.1	4.3	16.3	4.0	0.7	2.3	0.9	7.9
Selling, general and administrative expenses	4.4	4.9	4.8	5.4	7.9	23.0	2.3	2.1	2.0	6.8	13.2
Other operating expense, net	1.8	2.4	7.2	7.3	(17.8)	(0.9)	4.7	9.0	9.1	8.7	31.5
Equity in net (income) loss from affiliated companies	2.6	1.7	1.7	1.7	1.5	6.6	3.5	1.7	1.6	1.8	8.6
Other expense (income), net[2]	(2.5)	10.9	6.4	3.6	(0.7)	20.2	2.1	14.2	5.5	64.7	86.5
Joint venture depreciation, amortization and interest(a)	3.8	3.3	2.6	3.3	3.4	12.6	2.6	2.9	2.6	3.0	11.1
Adjusted EBITDA	**101.0**	**107.9**	**128.9**	**118.1**	**109.1**	**464.0**	**101.2**	**122.8**	**119.9**	**109.4**	**453.3**

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(1) For additional information with respect to each adjustment, see "Reconciliation of Non-GAAP Financial Measures"
(2) Other expense (income), net includes debt extinguishment costs

RECONCILIATION OF NON-GAAP FINANCIAL MEASURES

Descriptions to PQ Non-GAAP Reconciliations

a) We use Adjusted EBITDA as a performance measure to evaluate our financial results. Because our Catalysts segment includes our 50% interest in our Zeolyst Joint Venture, we include an adjustment for our 50% proportionate share of depreciation, amortization and interest expense of our Zeolyst Joint Venture.

b) Represents the amortization of the fair value adjustments associated with the equity affiliate investment in our Zeolyst Joint Venture as a result of the Business Combination. We determined the fair value of the equity affiliate investment and the fair value step-up was then attributed to the underlying assets of our Zeolyst Joint Venture. Amortization is primarily related to the fair value adjustments associated with inventory, fixed assets and intangible assets, including customer relationships and technical know-how.

c) As a result of the Sovitec acquisition and the Business Combination, there was a step-up in the fair value of inventory, which is amortized through cost of goods sold in the statements of income.

d) When asset disposals occur, we remove the impact of net gain/loss of the disposed asset because such impact primarily reflects the non-cash write-off of long-lived assets no longer in use.

e) Reflects the exclusion of the foreign currency transaction gains and losses in the statements of income primarily related to the Euro denominated term loan (which was settled as part of the February 2018 term loan refinancing) and the non-permanent intercompany debt denominated in local currency translated to U.S. dollars.

f) Represents non-cash adjustments to the Company's LIFO reserves for certain inventories in the U.S. that are valued using the LIFO method, which we believe provides a means of comparison to other companies that may not use the same basis of accounting for inventories.

g) Reflects consulting fees paid to CCMP and affiliates of INEOS for consulting services that include certain financial advisory and management services. These consulting agreements were terminated upon completion of our initial public offering on October 3, 2017.

h) Relates to certain transaction costs described in our condensed consolidated financial statements as well as other costs related to several transactions that are completed, pending or abandoned and that we believe are not representative of our ongoing business operations.

i) Includes the impact of restructuring, integration and business optimization expenses which are incremental costs that are not representative of our ongoing business operations.

j) Represents adjustments for defined benefit pension plan costs in our statements of income. More than two-thirds of our defined benefit pension plan obligations are under defined benefit pension plans that are frozen, and the remaining obligations primarily relate to plans operated in certain of our non-U.S. locations that, pursuant to jurisdictional requirements, cannot be frozen. As such, we do not view such expenses as core to our ongoing business operations.

k) Represents a non-cash gain on the write-off of the remaining liability under a contractual supply arrangement. As part of Eco's acquisition of substantially all of the assets of Solvay USA Inc's sulfuric acid refining services business unit on December 1, 2014, we recognized a liability as part of business combination accounting related to our obligation to serve a customer under a pre-existing unfavorable supply agreement. In December 2018, the customer who was party to the agreement closed its facility, and as a result, we were relieved from our obligation to continue to supply the customer on the below market contract. Because the fair value of the unfavorable contract liability was recognized as part of the application of business combination accounting, and since the write-off of the remaining liability was non-cash in nature, we believe this gain is a special item that is not representative of our ongoing business operations.

l) Other costs consist of certain expenses that are not core to our ongoing business operations, including environmental remediation-related costs associated with the legacy operations of our business prior to the Business Combination, capital and franchise taxes, non-cash asset retirement obligation accretion and the initial implementation of procedures to comply with Section 404 of the Sarbanes-Oxley Act. Included in this line-item are rounding discrepancies that may arise from rounding from dollars (in thousands) to dollars (in millions).

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