



INVESTOR PRESENTATION

February 2020



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 2020 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 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, adjusted diluted EPS, adjusted net income 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.

Zeolyst Joint Venture

Zeolyst International and Zeolyst C.V. (our 50% owned joint ventures that we refer to collectively as the “Zeolyst Joint venture”) are accounted for as an equity method investment in accordance with GAAP. The presentation of the Zeolyst Joint venture’s sales in this presentation represents 50% of the sales of the Zeolyst Joint venture. We do not record sales by the 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 the 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 the Zeolyst Joint venture for the relevant periods in the denominator.

PQ CORPORATION OVERVIEW



OUR COMPANY

BY THE NUMBERS



~200
years in
business



6
continents



~3,300
employees



~4,000
global
customers



~70
manufacturing
facilities

Long History: Founded in 1831

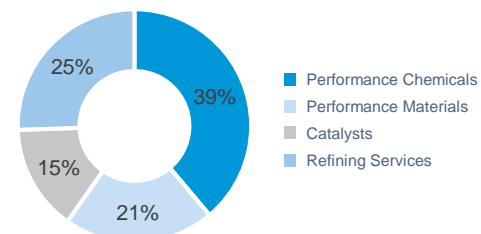
- Differentiated Specialty Businesses
- Innovation Culture
- Sustainable Products
- Track Record of Financial Stability

2019 FINANCIAL HIGHLIGHTS

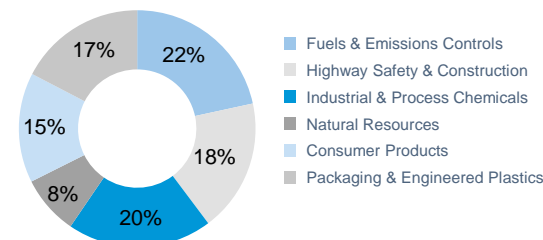
- Revenues¹: ~ \$1.6 Billion
- Adjusted EBITDA: ~\$474 Million
- Adjusted EBITDA Margin: ~ 27%
- Cash from Operations: ~ \$268 Million

2019 SALES AND ZEOLYST JV SALES²

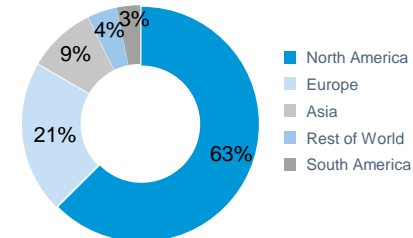
SEGMENT³



END USE



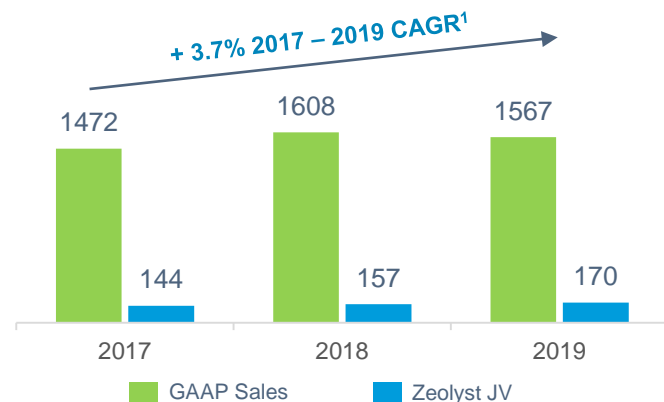
REGION



TRACK RECORD OF PERFORMANCE

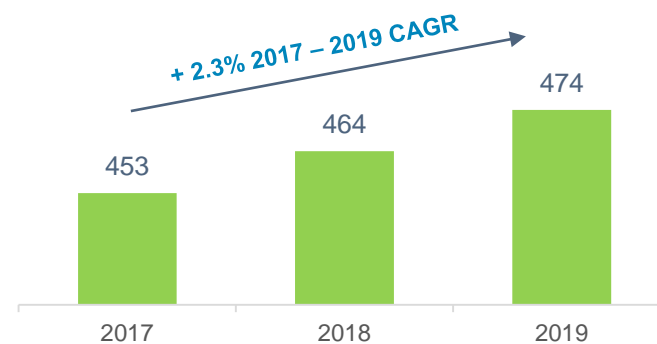
SALES

(\$ in millions)



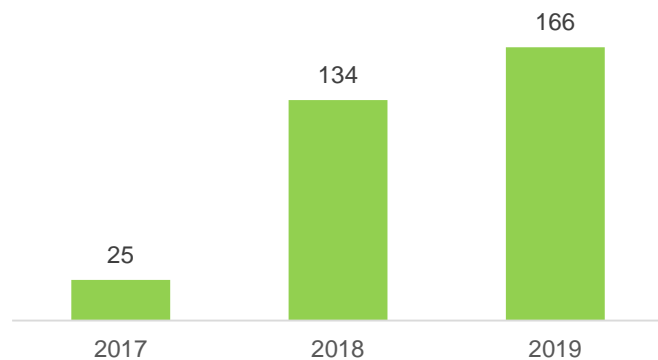
ADJUSTED EBITDA

(\$ in millions)

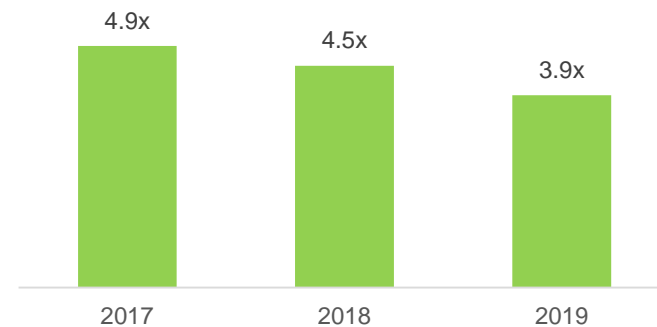


ADJUSTED FREE CASH FLOW

(\$ in millions)



NET DEBT / ADJUSTED EBITDA



PROGRESS ON PORTFOLIO ACTIONS

Simpler + **STRONGER**

Q4/18

- Embarked on strategic portfolio review
- Completed non-core asset sale for \$13 million



Q2/19

- Closed sale of Performance Chemicals product line for \$28 million



Q4/19

- Completed non-core asset sale for \$19 million



Q1/19

- Delayed and separated into 4 distinct businesses
- Established cross functional councils for optimization for technology, supply chain, manufacturing



Q3/19

- Entered agreement with INEOS to expand Silica Catalyst product line sales into Ziegler Natta technology



2020

- Completed Performance Materials asset swap with long term supply
- Launched Performance Chemicals transformation plan to accelerate growth and capital efficiency

REFINING SERVICES



Leading provider of sulfuric acid recycling services and end-to-end logistics for North American alkylation production for higher octane gasoline

COMPETITIVE STRENGTHS

Supplier to largest North America refineries

Multi-decade customer relationships as leading provider of reliable and quality acid regeneration end-to-end logistics and services

Largest Integrated Supply Network

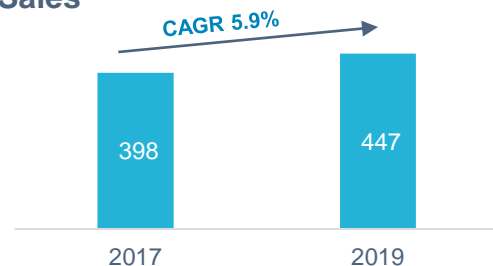
> 50% supplier of sulfuric acid regeneration demand, primarily in Gulf and West Coast with most flexible shipping modes (truck, rail, pipeline, and barge)

Favorable long-term contracts

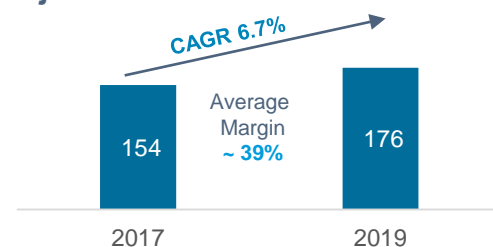
70% of regeneration contracts under 5 – 10 year take-or-pay terms, with ~90% costs protected with pass-through contract provisions

FINANCIAL HIGHLIGHTS

Sales



Adj. EBITDA



GROWTH DRIVERS

Shale oil share growth

~ 70% of US oil production expected by 2025, a 35% increase from 2019. Gasoline from shale oil requires more alkylate blending to meet minimum octane ratings

Demand increase in premium gasoline

Price spread between premium and regular gasoline resulted in ~13% CAGR (2014 -2019). Growing share of smaller, more efficient turbocharged engines requires higher octane rated gasoline

Rising gasoline exports

Exports are expected to increase ~ 7% by 2022. Gasoline exports contain no ethanol and require alkylate to meet higher octane requirements for destination countries

KEY APPLICATIONS

Acid
Regeneration



Specialty
virgin
acid for
batteries



Industrial



CATALYSTS



Leading global supplier of specialty and emission control catalysts for global refineries and PE and MMA producers and licensors

COMPETITIVE STRENGTHS

Key supplier for global refineries

A 30 year joint venture with Shell, a leading established supplier of zeolite-based catalysts for hydrocracking and dewaxing

Leader in zeolite technology for HDD

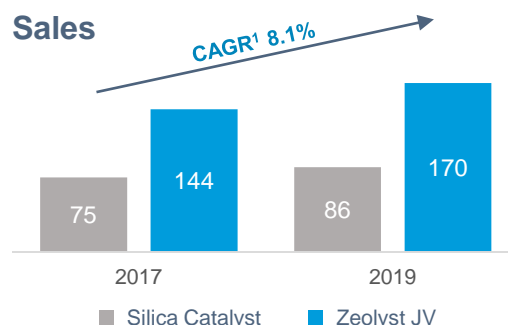
Supplier to top 3 global emission control producers that enables > 90% removal of NOx emissions from diesel engine tailpipe, typically for life of the vehicle platform

Specified with PE and MMA producers

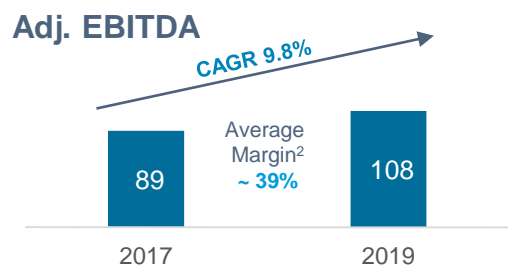
A leading global provider of silica supports and catalysts and sole catalyst supplier for Alpha technology to top MMA producer, supported with long-term contracts

FINANCIAL HIGHLIGHTS

Sales



Adj. EBITDA



GROWTH DRIVERS

Broader adoption of emissions standards

Increasing global compliance for low sulfur fuels for both on-road and non-road engines, driving increased global hydrocracking capacity investments

Tightening vehicle emission standards

Continued stricter US and Europe regulations to limit diesel engine emissions, with other regions implementing similar standards including China in 2020

Trend for lighter and stronger plastics

~ 80% of PE capacity expansions through 2024 require silica-based catalysts technology

KEY APPLICATIONS

Lower sulfur fuel



Lower NOx emissions



Flexible pipe for gas, water, sewer mains



PERFORMANCE MATERIALS



Global leader in engineered glass microspheres for transportation safety marking and highly specialized industrial applications

COMPETITIVE STRENGTHS

Transportation safety lead bead supplier

~100-year glass technology leader and supplier to North America, Europe, Latin America, and Asia Pacific (ex-China)

Extensive global supply network

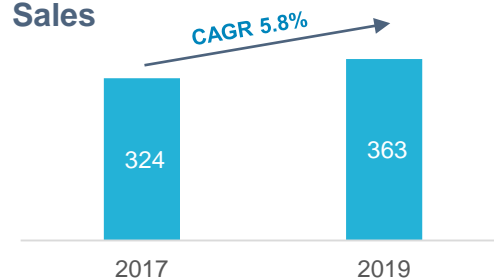
Serve > 2,000 customers globally with reputation for meeting stringent quality and specification requirements by country, state and region with short lead delivery times

Co-production for industrial applications

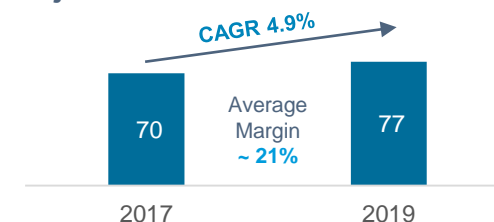
Utilizing engineering expertise and efficient co-production to provide wide variety of applications for industrial and consumer applications while achieving lower input costs for customers

FINANCIAL HIGHLIGHTS

Sales



Adj. EBITDA



GROWTH DRIVERS

Steady highway demand

Replacement or re-stripping of existing markings, funded by gasoline taxes and new infrastructure drives steady growth

Higher safety regulations

Aging population and autonomous vehicle navigation are driving higher standards for more reflective beads and/or wider line markings to enhance visibility and safety in all weather conditions

Lightweighting & materials substitution

Rising demand for lightweighting, strength and mold flexibility in plastics and other materials, environmentally safe solutions for metal cleaning and substitution in electronic consumer applications

KEY APPLICATIONS

Superior visibility highway markings



Lightweighting consumer products



Structural enhancers in polymers & plastics



PERFORMANCE CHEMICALS



Leading global producer of sodium silicates, specialty silicas and silicate derivatives for broad range of industrial and consumer uses

COMPETITIVE STRENGTHS

Strategic global infrastructure

Largest global sodium silicates supplier, at least 2x larger than nearest competitor supplying multinational customers' needs locally

Vertically integrated silicate expertise

Production flexibility, innovation and technical know how enable a broad array of end use applications, including downstream for higher margin niche consumer goods

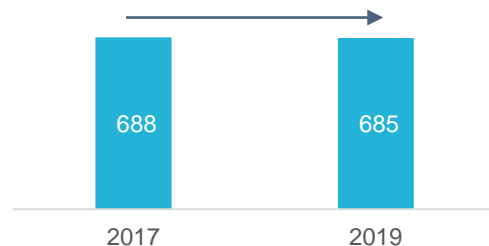
50+ years customer relationships

> 70% sales contracted for 1 – 3 year terms, with ability in most cases to pass through changes in raw material costs

FINANCIAL HIGHLIGHTS

Sales

CAGR -0.2%



Adj. EBITDA

CAGR -4.9%



GROWTH DRIVERS

Shifting consumer preferences

Silicates and silicate derivatives are recognized as environmentally friendly consumer product applications

Regulation driven substitution

Enabling the removal of other chemical materials such as phosphates for cleaning, formaldehyde-based adhesives in construction and volatile organic compounds in coatings

Higher performance standards

Clarification and purification in beverages, edible oils and biofuel feedstocks, flow aids for food and feed, improving dental cleaning without excessive abrasion

KEY APPLICATIONS

Personal
care
products



Coatings



Beverages



PERFORMANCE CHEMICALS TRANSFORMATION

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DRIVERS:

- Commercial effectiveness
- Productivity and sustainability improvements
- Capital efficiency



MANUFACTURING EXCELLENCE:

Accelerate productivity and throughput



NETWORK OPTIMIZATION:

Align footprint with growth opportunities



ENHANCE CUSTOMER EXPERIENCE



INTEGRATED BUSINESS MANAGEMENT:

Step change in supply/demand planning



COMMERCIAL DISCIPLINE:

Enhance customer account management

EXPECTED BENEFIT:

- \$10 million to \$15 million Adjusted EBITDA annualized in 12 to 18 months

INNOVATION: ~ 200 YEARS OF SUCCESSFUL COMMERCIALIZATION



>\$700 million in sales from new products over the last 5 years¹

BALANCED INNOVATION APPROACH ENABLES GROWTH



10

Innovation
Facilities

130

Scientists &
Technologists

- Experienced product development team with strong customer relationships
- Significant expertise in silicates, silica, zeolites, glass, and catalyst technologies
- Ability to tailor and scale specialty grades to meet changing demands
- Robust product development pipeline expected to drive new growth
- Disciplined innovation process to reduce time to market
- Extensive pilot capabilities to refine process economics and value to customers and technical support for large scale commercialization

INNOVATION EXAMPLES:

Performance Materials



Highway markings



Metal Finishing



Consumer products



Polymer/plastics enhancers

Performance Chemicals



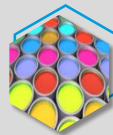
Personal Care



Silicates for oil drilling



Water purification



Paints

Catalysts



Zeolites for diesel emission control



Zeolites for dewaxing



Silicas for polyolefin



Catalysts for MMA

PQ's PRODUCTS FOR A SUSTAINABLE FUTURE



Inorganic Materials Drive ~ 75% of our Sales¹



REFINING SERVICES



Largest North America recycler of spent sulfuric acid, avoiding 1.5 million tons of landfill or deep well disposal annually



One of the largest consumers of refinery by-product sulfur, converting for other applications



World class low SO₂ emissions



CATALYSTS



Remove sulfur from diesel fuel for land and marine transportation



Provide active component for > 90% reduction of NOx emissions from diesel engines



Improve fuel economy by reducing friction in lubricants



PERFORMANCE MATERIALS



Recycle > 1 billion pounds of glass per year, avoiding landfill disposal



Improve safety and save lives through superior road and airport marking technologies



Glass bead applications provide alternative to petroleum-based solvents for industrial cleaning and surface finishing applications



PERFORMANCE CHEMICALS



Silica-based sensory particles for personal care products replace plastic spheres



Specialty silicas for use in environmentally-friendly low VOC coatings



Sodium silicate used in production of silica to replace carbon black in fuel efficient "green tires"



Sodium silicates inhibit corrosion in municipal water treatment pipelines



Safety Conscious



Emissions



Recyclability



Environmentally Friendly



Efficient Energy Usage



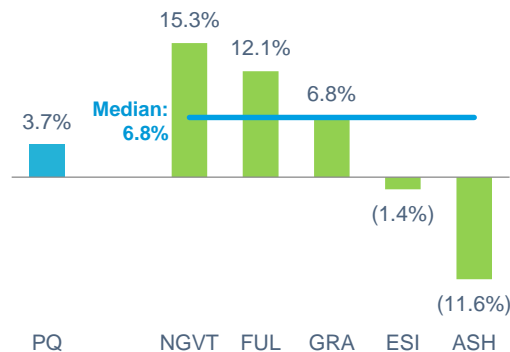
Innovative Green Solution

PQ UNDERVALUED VS SPECIALTY CHEMICAL PEERS

Metrics

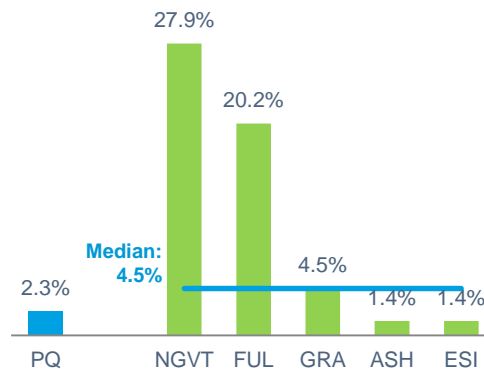
Sales

'17A – '19A CAGR^{1,2}



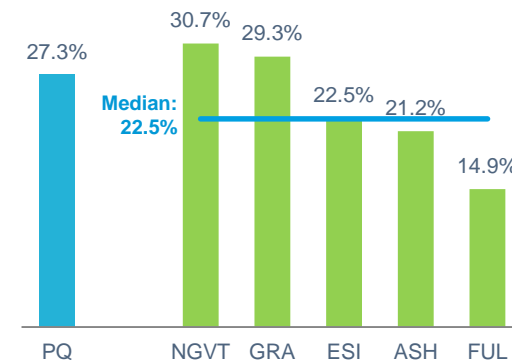
Adj EBITDA

'17A – '19A CAGR^{1,2}



Adj EBITDA Margin

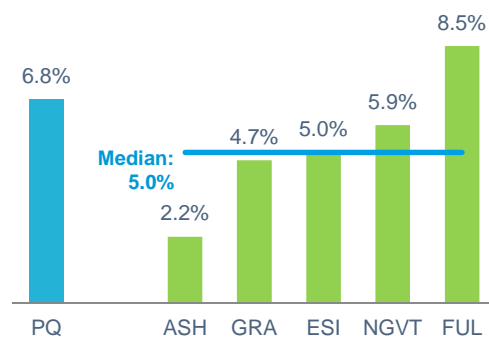
'19A^{1,2}



Valuation

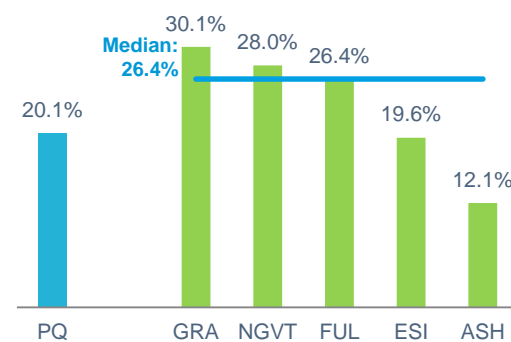
FCF Yield

'19A FCF^{1,2,3} / Market Cap



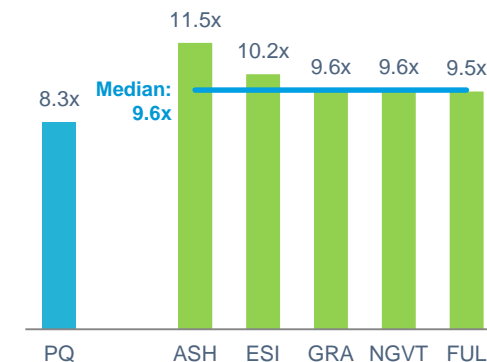
Tangible ROIC^{1,4}

'18A



Adj EBITDA Multiple

TEV¹ / '20E EBITDA



Source: Company filings, CapIQ consensus data as of February 18, 2020

Notes: PQ and Peers are not adjusted for M&A

(1) PQ figures are updated for 2019 and include 50% proportional share of Zeolyst Joint venture sales

(2) ESI 2019 numbers are based on market consensus as actual financials haven't been announced

(3) Free Cash Flow calculated as Cash Flow from Operations – Capex

(4) Tangible ROIC calculated as (EBITA less cash taxes) / Avg. Invested Capital

WHY PQ's SPECIALTY CHEMICAL PORTFOLIO?



#1 and #2 positions in nearly all product lines



Sustainable growth from diverse underlying secular macro trends



Strategic and extensive global manufacturing network



Input cost small as percentage of customer total product cost



Track record of innovation and customer collaboration



Environmentally friendly end use applications and solutions

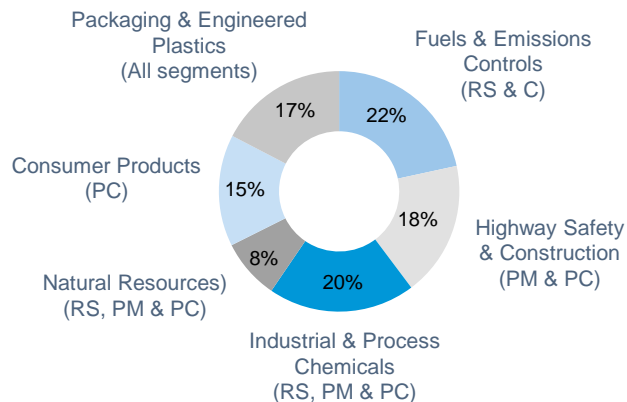


Stable, high-margins drive strong sustainable free cash flow

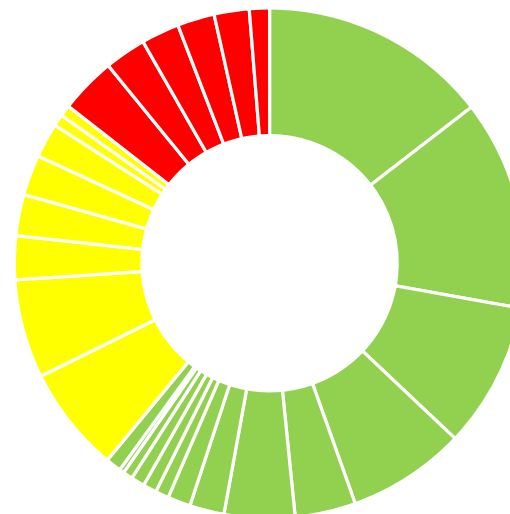
SUPPLEMENTAL INFORMATION

A PORTFOLIO OF STABILITY

% of 2019 Sales by End Use¹



End Use Categorized by Sensitivity to Downturn²



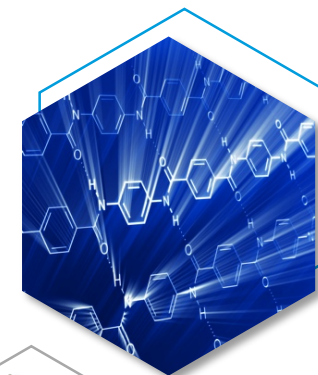
Six Primary End Uses
Serve ~28
Secondary End Uses

Sensitivity to Economic Downturn (% of Sales)



2020 GUIDANCE

(\$ in millions, except % and per share)	2019 Actual	2020 Outlook
Sales	1,567.1	1,595 – 1,625
Adjusted EBITDA	474.3	470 – 480
Adjusted Free Cash Flow	166.2	155 – 175
Adjusted Diluted EPS	0.92	0.85 – 1.02
Interest Expense	111.5	100 – 105
Depreciation & Amortization		
PQ	182.1	180 – 190
Zeolyst JV	14.7	14 – 16
Capital Expenditures	127.6	130 – 140
Effective Tax Rate (ex tax reform)	24.6%	Mid 20%



QUARTERLY SEGMENT SALES, ADJUSTED EBITDA AND MARGINS

Year 2019, 2018 and 2017

(\$ in millions except %, unaudited)	Three Months Ended				Year Ended	Three Months Ended				Year Ended	Year Ended
	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019	December 31, 2019	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018	December 31, 2018	December 31, 2017
Sales:											
Refining Services	105.8	117.3	118.3	105.7	447.1	100.7	112.1	123.4	119.4	455.6	398.4
Silica Catalysts	15.9	20.9	25.6	23.3	85.7	16.5	17.3	16.3	22.0	72.1	75.3
Performance Materials	61.1	118.9	115.1	67.9	363.0	62.7	126.5	115.4	73.7	378.3	324.2
Performance Chemicals	180.5	177.8	167.9	158.9	685.1	190.0	183.8	174.7	168.8	717.3	687.6
Eliminations	(4.1)	(3.2)	(3.1)	(3.4)	(13.8)	(3.7)	(5.0)	(2.6)	(3.8)	(15.1)	(13.4)
Total sales	359.2	431.7	423.8	352.4	1,567.1	366.2	434.7	427.2	380.1	1,608.2	1,472.1
Zeolyst joint venture sales	29.5	39.1	54.4	47.3	170.3	38.3	49.5	32.3	36.5	156.7	143.8
Adjusted EBITDA:											
Refining Services	39.7	42.8	51.2	41.9	175.6	35.5	41.3	49.6	50.1	176.5	154.2
Catalysts	18.1	29.6	31.6	28.5	107.8	22.9	23.6	15.7	18.9	81.1	89.4
Performance Materials	10.5	29.2	25.8	11.2	76.7	12.1	28.6	21.3	10.5	72.5	69.7
Performance Chemicals	42.7	41.2	36.8	33.6	154.3	45.1	44.8	41.8	39.2	170.9	170.5
Total Segment Adjusted EBITDA	111.0	142.8	145.4	115.2	514.4	115.6	138.3	128.4	118.7	501.0	483.8
Corporate	(10.0)	(10.3)	(7.7)	(12.1)	(40.1)	(7.7)	(9.4)	(10.3)	(9.6)	(37.0)	(30.5)
Total Adjusted EBITDA	101.0	132.5	137.7	103.1	474.3	107.9	128.9	118.1	109.1	464.0	453.3
Adjusted EBITDA Margin:											
Refining Services	37.5%	36.5%	43.3%	39.6%	39.3%	35.3%	36.8%	40.2%	42.0%	38.7%	38.7%
Catalysts ¹	40.0%	49.4%	39.5%	40.4%	42.1%	41.8%	35.3%	32.3%	32.3%	35.4%	40.8%
Performance Materials	17.2%	24.6%	22.4%	16.5%	21.1%	19.3%	22.6%	18.5%	14.2%	19.2%	21.5%
Performance Chemicals	23.7%	23.1%	21.9%	21.1%	22.5%	23.7%	24.4%	23.9%	23.2%	23.8%	24.8%
Total Adjusted EBITDA Margin¹	26.0%	28.1%	28.8%	25.8%	27.3%	26.7%	26.6%	25.7%	26.2%	26.3%	28.1%

ADJUSTED FREE CASH FLOW

(\$ in millions)	Full Year 2019	Full Year 2018	Full Year 2017
Cash Flow from Operations before interest and tax	401.9	377.5	364.5
Less:			
Cash paid for taxes	17.4	23.8	29.2
Cash paid for interest ¹	116.8	105.1	170.1
Cash Flow from Operations	267.7	248.6	165.2
Less: Purchases of property, plant and equipment ²	127.6	131.7	140.5
Free Cash Flow	140.1	116.9	24.7
Plus: Proceeds from sale of assets	17.6	12.4	-
Plus: Net interest proceeds on currency swaps	8.5	4.9	-
Adjusted Free Cash Flow	166.2	134.2	24.7



RECONCILIATION OF NET INCOME TO SEGMENT ADJUSTED EBITDA

Year 2019, 2018 and 2017

(\$ in millions)	Three Months Ended				Year Ended	Three Months Ended				Year Ended	Year Ended
	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019	December 31, 2019	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018	December 31, 2018	December 31, 2017
Reconciliation of net income attributable to PQ Group Holdings Inc. to Segment Adjusted EBITDA											
Net income attributable to PQ Group Holdings Inc.	3.2	30.6	26.7	19.1	79.5	0.2	15.8	14.2	28.2	58.3	57.6
Provision for (benefit from) income taxes	2.4	20.3	16.7	1.2	40.7	(0.5)	13.6	8.5	7.4	29.0	(119.2)
Interest expense	28.6	28.5	27.7	26.7	111.5	29.2	27.2	28.2	29.1	113.7	179.0
Depreciation and amortization	45.9	45.1	44.2	46.9	182.1	48.5	47.0	43.8	45.9	185.2	177.1
EBITDA	80.1	124.5	115.3	93.9	413.8	77.4	103.6	94.7	110.6	386.2	294.5
Joint venture depreciation, amortization and interest ^a	3.8	3.7	3.7	3.5	14.7	3.3	2.6	3.3	3.4	12.6	11.1
Amortization of investment in affiliate step-up ^b	2.6	1.7	1.7	1.7	7.5	1.7	1.7	1.7	1.6	6.6	8.6
Amortization of inventory step-up ^c	—	—	—	—	—	1.6	—	—	—	1.6	0.9
Impairment of fixed assets, intangibles and goodwill	—	—	—	1.6	1.6	—	—	—	—	—	—
Debt extinguishment costs	—	—	1.8	1.6	3.4	5.9	—	0.9	1.1	7.8	61.9
Net loss (gain) on asset disposals ^d	0.8	(9.7)	1.1	(5.3)	(13.1)	1.2	4.8	5.2	(4.5)	6.6	5.8
Foreign currency exchange (gain) loss ^e	(2.7)	3.6	4.5	(2.6)	2.8	5.1	6.8	3.5	(1.5)	13.8	25.8
LIFO expense ^f	10.2	0.1	0.5	0.3	11.1	4.9	0.1	0.9	2.5	8.4	3.7
Management advisory fees ^g	—	—	—	—	—	—	—	—	—	—	3.8
Transaction and other related costs ^h	0.1	1.0	0.7	1.8	3.6	0.4	0.3	0.2	—	0.9	7.4
Equity-based and other non-cash compensation	3.4	5.4	4.8	4.6	18.2	3.8	3.8	4.3	7.6	19.5	8.8
Restructuring, integration and business optimization expenses ⁱ	0.7	—	0.7	2.7	4.1	1.1	2.4	2.2	8.3	14.0	13.2
Defined benefit plan pension cost (benefit) ^j	1.0	0.6	0.8	0.7	3.1	0.6	(0.4)	0.1	(1.1)	(0.8)	2.9
Gain on contract termination ^k	—	—	—	—	—	—	—	—	(20.6)	(20.6)	—
Other ^l	1.0	1.6	2.1	(1.4)	3.5	0.9	3.2	1.1	1.7	7.4	4.9
Adjusted EBITDA	101.0	132.5	137.7	103.1	474.3	107.9	128.9	118.1	109.1	464.0	453.3
Unallocated corporate costs	10.0	10.3	7.7	12.1	40.1	7.7	9.4	10.3	9.7	37.0	30.5
Total Segment Adjusted EBITDA¹	111.0	142.8	145.4	115.2	514.4	115.6	138.3	128.4	118.8	501.0	483.8
EBITDA Adjustments by Line Item											
EBITDA	80.1	124.5	115.3	93.9	413.8	77.4	103.6	94.7	110.6	386.2	294.5
Cost of goods sold	10.8	0.4	0.9	0.9	13.0	7.3	2.6	2.1	4.3	16.3	7.9
Selling, general and administrative expenses	4.4	5.9	5.7	5.6	21.6	4.9	4.8	5.4	7.9	23.0	13.2
Other operating expense (income), net	1.8	(7.3)	6.5	(1.0)	—	2.4	7.2	7.3	(17.8)	(0.9)	31.5
Equity in net (income) from affiliated companies	2.6	1.7	1.7	1.7	7.7	1.7	1.7	1.7	1.6	6.6	8.6
Other expense (income), net ²	(2.5)	3.6	3.9	(1.5)	3.5	10.9	6.4	3.6	(0.9)	20.2	86.5
Joint venture depreciation, amortization and interest(a)	3.8	3.7	3.7	3.5	14.7	3.3	2.6	3.3	3.4	12.6	11.1
Adjusted EBITDA	101.0	132.5	137.7	103.1	474.3	107.9	128.9	118.1	109.1	464.0	453.3

RECONCILIATION OF QUARTERLY NET INCOME TO ADJUSTED NET INCOME AND ADJUSTED DILUTED EARNINGS PER SHARE

Year 2019 and 2018

(\$ in millions except share and per share data)	Three Months Ended				Year Ended	Three Months Ended				Year Ended
	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019	December 31, 2019	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018	December 31, 2018
Net Income	3.5	30.7	26.8	19.4	80.3	0.5	16.2	14.4	28.5	59.6
Less: Net income attributable to the non-controlling interest	0.3	0.1	0.1	0.3	0.8	0.3	0.4	0.2	0.3	1.3
Net Income attributable to PQ Group Holdings, Inc. ¹	3.2	30.6	26.7	19.1	79.5	0.2	15.8	14.2	28.2	58.3
Diluted net income per share:	0.02	0.23	0.20	0.14	0.59	—	0.12	0.11	0.21	0.43
Net Income attributable to PQ Group Holdings, Inc. ¹	3.2	30.6	26.7	19.1	79.5	0.2	15.8	14.2	28.2	58.3
Amortization of investment in affiliate step-up ^b	1.6	1.0	1.1	1.2	5.0	1.2	1.0	0.9	1.0	4.1
Amortization of inventory step-up ^c	—	—	—	—	—	1.1	—	—	—	1.0
Impairment of long-lived assets	—	—	—	1.1	1.1	—	—	—	—	—
Debt extinguishment costs	—	—	1.2	1.1	2.3	4.1	—	0.2	0.6	4.9
Net loss (gain) on asset disposal ^d	0.5	(7.4)	0.8	(3.5)	(9.7)	0.8	3.1	2.9	(2.7)	4.2
Foreign currency exchange (gain) loss ^e	(2.0)	4.1	3.9	(1.7)	4.3	2.9	5.2	4.0	(3.8)	8.2
LIFO expense ^f	6.5	0.2	0.4	0.4	7.4	3.4	—	0.3	1.7	5.3
Transaction and other related costs ^h	0.1	0.6	0.4	1.3	2.4	0.3	0.2	0.1	—	0.6
Equity-based and other non-cash compensation	2.2	3.5	3.2	3.3	12.1	2.6	2.5	2.2	7.6	14.9
Restructuring, integration and business optimization expenses ⁱ	0.5	—	0.5	1.8	2.7	0.7	1.6	1.2	5.3	8.8
Defined benefit pension plan cost (benefit) ^j	0.6	0.4	0.5	0.5	2.1	0.4	(0.3)	0.1	(0.7)	(0.5)
Gain on contract termination ^k	—	—	—	—	—	—	—	—	(13.0)	(13.0)
Other ^l	0.6	1.0	1.4	(1.0)	2.2	0.7	2.0	0.4	1.3	4.6
Adjusted net income, including tax reform and non-cash GILTI tax	13.8	34.0	40.1	23.6	111.4	18.4	31.1	26.5	25.5	101.4
Impact of non-cash GILTI tax ²	3.7	7.5	8.2	(5.6)	13.8	2.5	5.0	11.4	2.2	21.2
Impact of tax reform ³	—	—	—	0.0	0.0	—	1.1	(2.5)	(4.5)	(6.0)
Adjusted net income	17.5	41.5	48.3	18.0	125.2	20.9	37.2	35.4	23.2	116.6
Adjusted diluted net income per share:	0.13	0.31	0.36	0.13	0.92	0.16	0.28	0.26	0.17	0.87
Diluted Weighted Average shares outstanding	134.9	135.3	135.6	136.2	135.5	133.9	134.2	134.6	135.0	134.7

(1) For additional information with respect to each adjustment, see "Reconciliations of Non-GAAP Financial Measures" within this appendix

(2) Amount represents the impact to tax expense in net income before non-controlling interest and the related adjustments to net income associated with GILTI provisions of the Tax Cuts and Jobs Act of 2017 ("TCJA"). Beginning January 1, 2018, GILTI results in taxation of "excess of foreign earnings," which is defined as amounts greater than a 10% rate of return on applicable foreign tangible asset basis. The Company is required to record incremental tax provision impact with respect to GILTI as a result of having historical U.S. net operating loss ("NOL") amounts to offset the GILTI taxable income inclusion. This NOL utilization precludes us from recognizing foreign tax credits ("FTCs") which would otherwise help offset the tax impacts of GILTI. No FTCs will be recognized with respect to GILTI until our cumulative NOL balance has been exhausted. Because the GILTI provision does not impact our cash taxes (given available U.S. NOLs), and given that we expect to recognize FTCs to offset GILTI impacts once the NOLs are exhausted, we do not view this item as a component of core operations.

(3) Represents the provisional benefit (loss) for the impact of the U.S. Tax Cuts and Jobs Act of 2017 and the Dutch Tax Plan 2019 recorded in Net Income

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 the Zeolyst Joint venture, we include an adjustment for our 50% proportionate share of depreciation, amortization and interest expense of the Zeolyst Joint venture.
- b) Represents the amortization of the fair value adjustments associated with the equity affiliate investment in the Zeolyst Joint venture as a result of the combination of the businesses of PQ Holdings Inc. and Eco Services Operations LLC in May 2016 (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 the 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. During the year ended December 31, 2019, the net gain on asset disposals includes the gains related to the sale of a non-core product line and sale of property.
- e) Reflects the exclusion of the foreign currency transaction gains and losses in the statements of income primarily related to the non-permanent intercompany debt denominated in local currency translated to U.S. dollars and, during 2018 and 2017, the Euro denominated term loan (which was settled as part of the February 2018 term loan refinancing).
- 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 ("IPO") on October 3, 2017.
- h) Represents the 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 the acquisition by Eco Services Operations LLC of substantially all of the assets of Solvay USA Inc.'s sulfuric acid refining 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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