Chemical industry in an urban development area

Amsterdam Chemistry Innovation Day

Albemarle Catalysts Amsterdam
Frits van der Sluis, GBU Sustainability Manager
October 30th, 2020

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Agenda

- Albemarle Corporation in a nutshell
- Albemarle Catalysts; a global leader in catalyst technology
- Our catalysts site in Amsterdam
- Amsterdam city development
- How can the city and Albemarle grow together
- Q&A

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Albemarle Corporation in a nutshell

KEY STATS

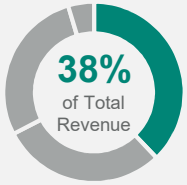
Founded	1887 132 years
Global Employees	~6000
Countries	~75
Dividend Payout Ratio	27%

FINANCIAL HIGHLIGHTS[3]

Net Sales	$3.6B
Net Income	$533M
Adj. EBITDA	$1,037M
Adj. EBITDA Margin	29%

BUSINESS OVERVIEW

Making the World Safe and Sustainable by Powering the Potential of People

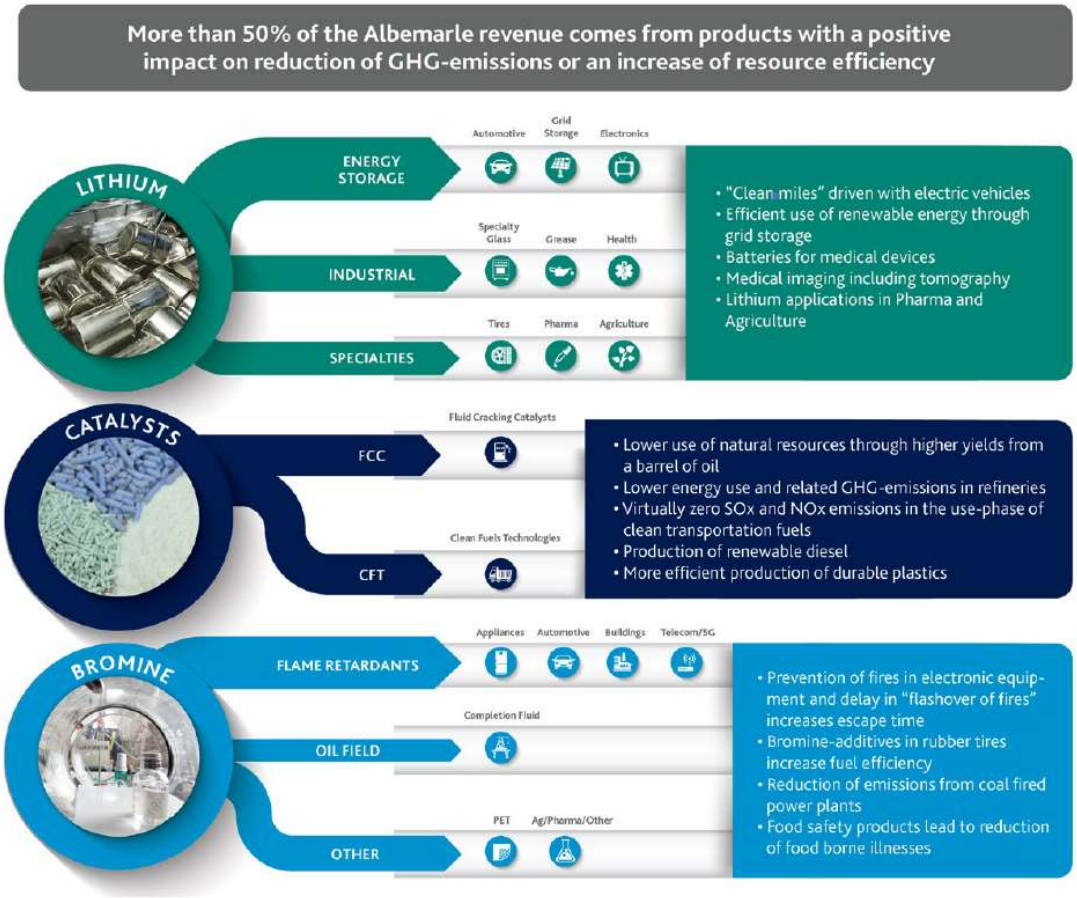
Lithium	Catalysts	Bromine Specialties
		
39% Adj. EBITDA Margin	26% Adj. EBITDA Margin	33% Adj. EBITDA Margin
~20% Industry Growth	~3% Industry Growth	~2% Industry Growth

REVENUE BY GEOGRAPHY

24% North America	23% EMEA	50% Asia (13% in China)	3% RoW

Our products have enormous value in their use-phase

- **Lithium** is essential for batteries and thus enables the electrification of mobility
- Use of the Hydroprocessing **Catalysts** (produced in Amsterdam) leads to avoidance of 10 million ton of Sulfur emissions (remember acid rain ?)



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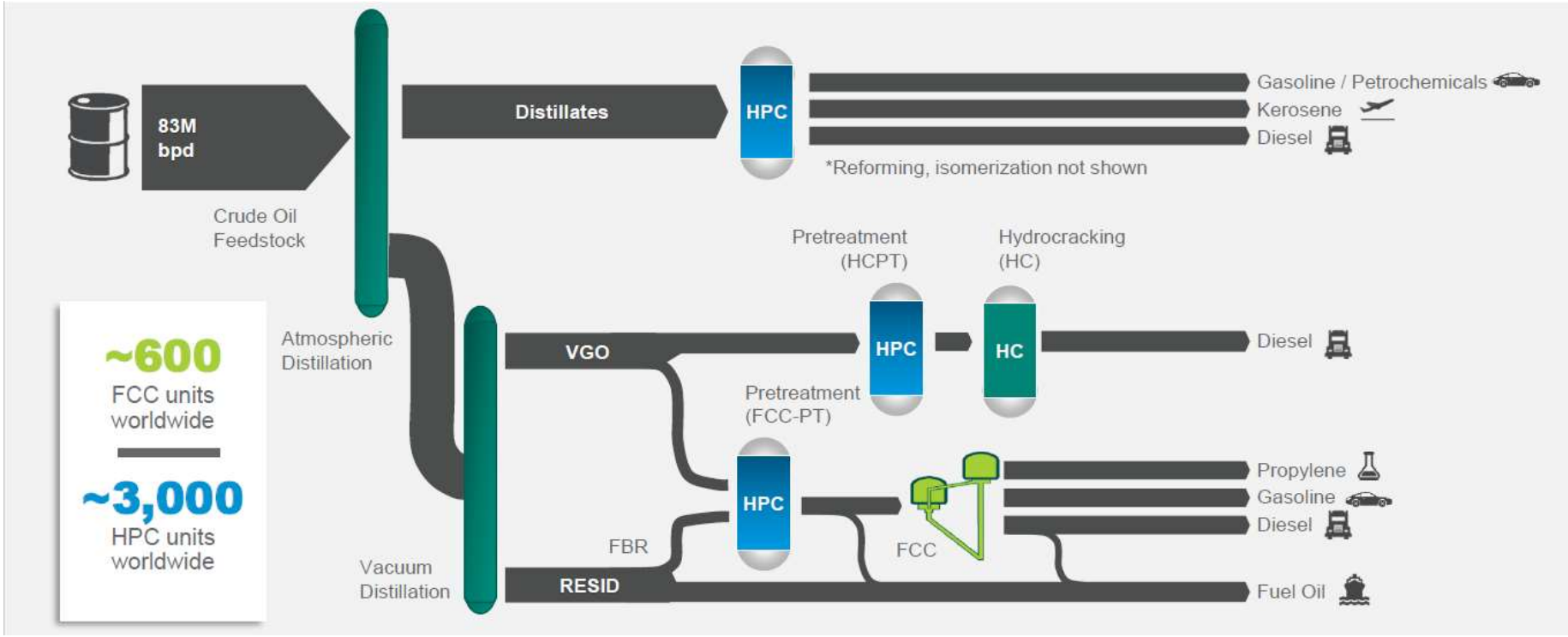
Albemarle Catalysts: Global Leader in Catalyst Technology

- **Catalyst definition**
  - A catalyst is a substance that chemical plants and refiners use to control chemical reactions.

- **Fluid Catalytic Cracking Catalyst (FCC)**
  - FCC catalyst is a fine powder, contains zeolites and active ingredients to break down large oil molecules in smaller fractions (diesel, gasoline etc.).
  - FCC catalysts allow refineries to produce the required oil fractions efficiently.
- **Hydro Processing Catalyst (HPC)**
  - HPC catalyst is an extrudate, contains active ingredients (Ni-Mo / Co-Mo) deposited on silica-alumina support.
  - HPC catalysts allow refineries to remove oil impurities (i.e. sulfur, nitrogen) from oil fractions to produce ‘Clean Fuels’.

Refineries produce efficiently, increasingly cleaner transportation fuels

Crude oil is efficiently cracked, nitrogen and sulfur are removed using our catalysts



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Our catalysts site in Amsterdam-North

Albemarle Catalysts in Amsterdam

1835 Ketjen family starts sulphuric acid production in Amsterdam-Center

1900 The plant is relocated to Amsterdam-North (a green field……)

1953 Ketjen starts with the production of FCC catalysts

1956 Start production of HPC-catalysts

1960 Ketjen is acquired by KZO, and merges into Akzo in 1969

1994 Akzo merges with Nobel Industries

2004 Albemarle corporation acquires Akzo Nobel Catalysts

Construction of FCC plant in 1952

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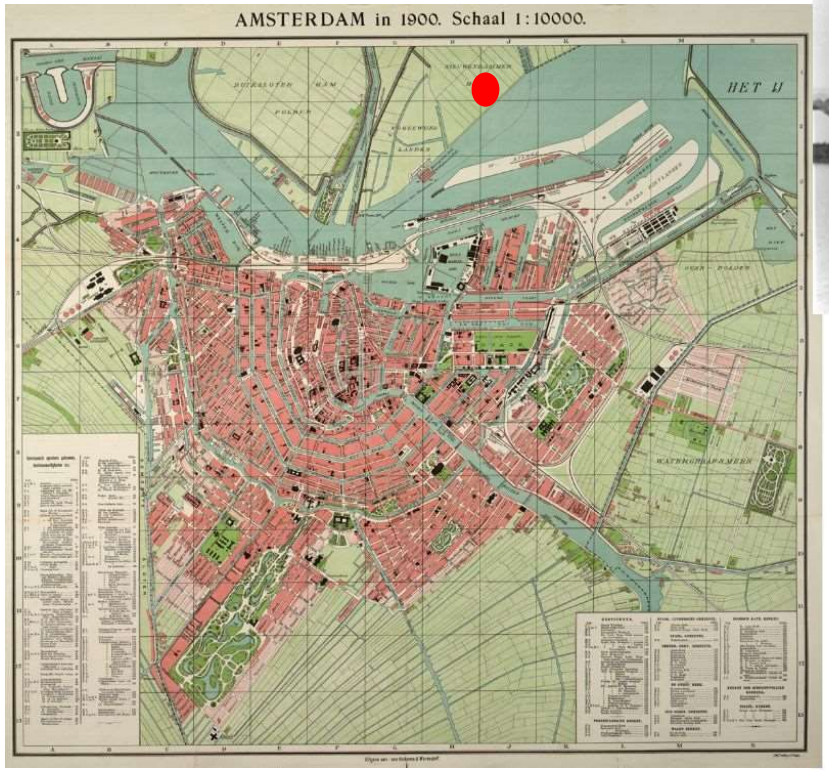
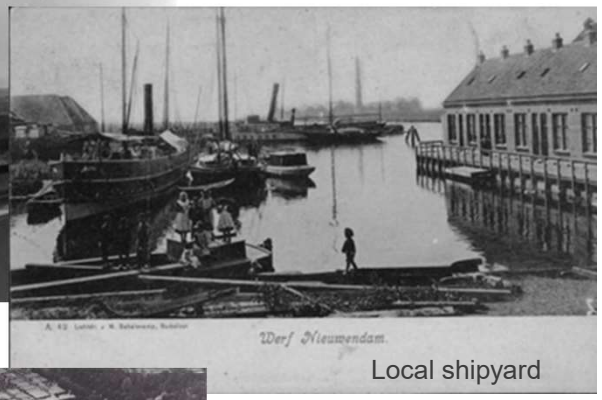
Amsterdam-North 1900-1930

A green field……..



Green fields around 1900



Local shipyard

The Amsterdam site in the 30's

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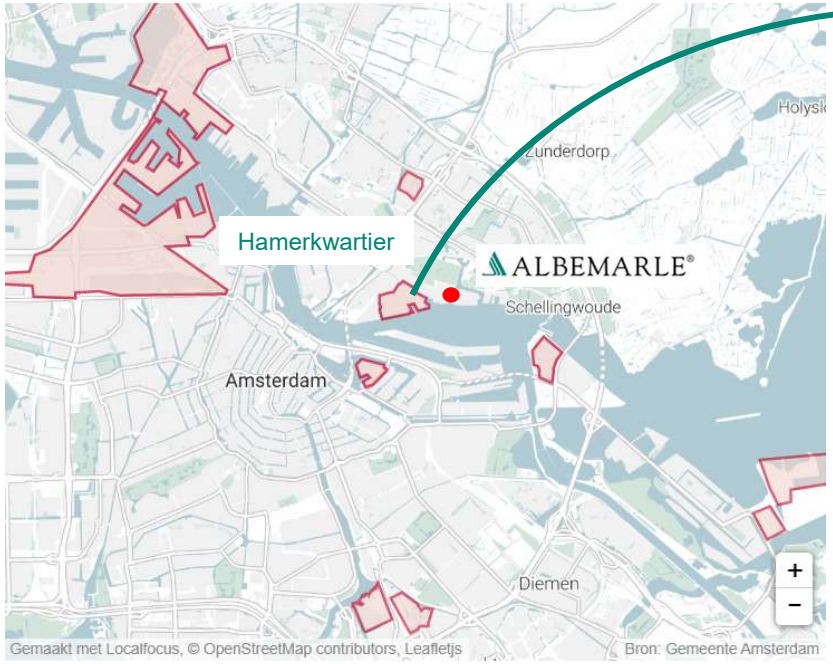
Amsterdam is growing!

Planned development of the Hamerkwartier near Albemarle

Amsterdam housing plan 2018-2025:

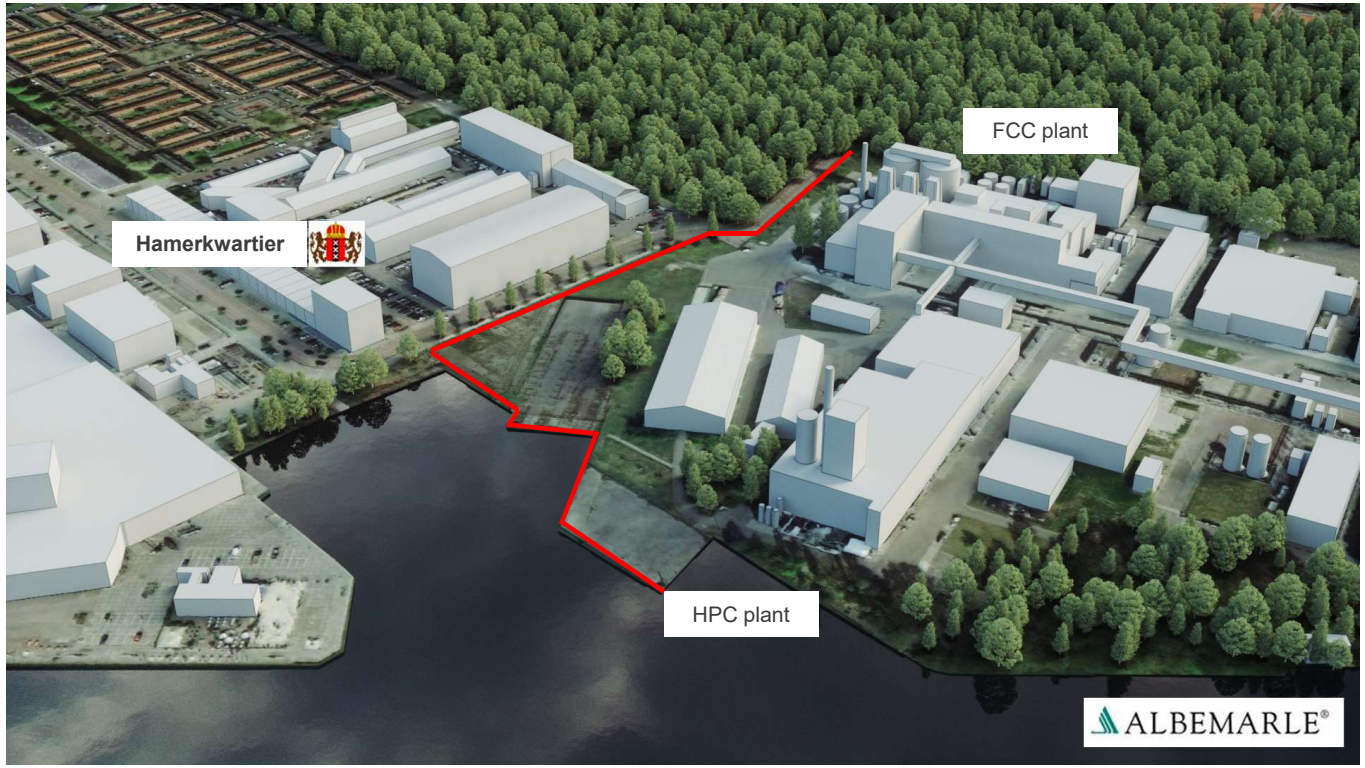
- -2025: 52,500 new houses
- Hamerkwartier: 6,700 new apartments



https://www.amsterdam.nl/bestuur-organisatie/volg-beleid/ontwikkeling/bouwen/

Hamerkwartier – ‘a mixed living and working area’

Hamerkwartier – present situation



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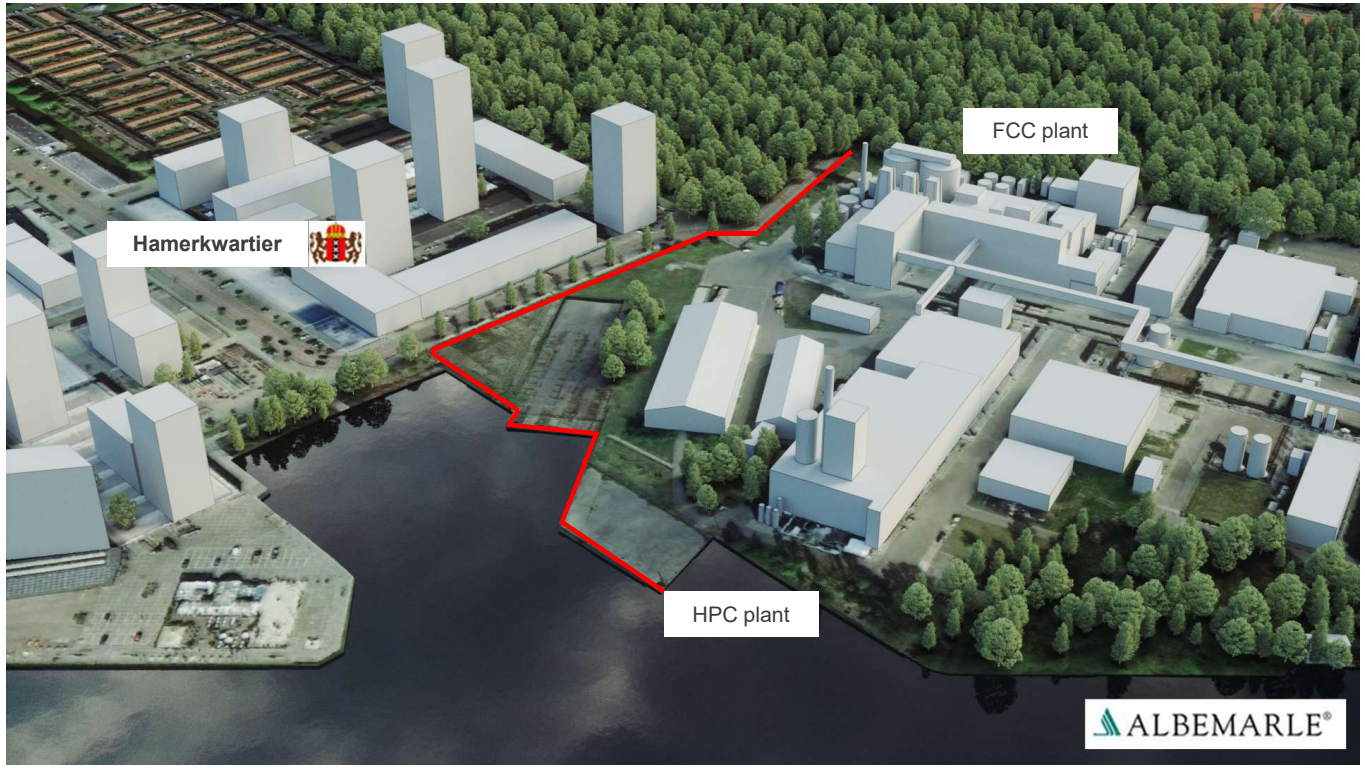
Hamerkwartier – planned development



The design of ‘Living and working together……’

Starts with learning about the potential impact of a chemical plant to a development……..

Periodic meetings were planned with the projectgroup ‘Hamerkwartier’ of the city of Amsterdam to raise awareness about the potential impact of:

- Hazards [1]
- Noise [1]
- Emissions
- Smell
- Other potential nuisances

VNG [2] guidelines gives ‘safe distances’ for all environmental aspects. Deviation (i.e. customization) is possible but needs to be motivated.

1 Quantitative Risk Analyses models and noise models can be applied for impact calculation
2 VNG = Association of dutch municipalities

‘Living and working together’ requires customization and therefore close cooperation between the city of Amsterdam and Albemarle

Customization to regular and irregular operation

Aspect	VNG guideline (cat. 5.2.)	Regular Operation (licensed operation)	Irregular Operation (technical or operational malfunctions)
hazard	700 m		
noise	500 m		
smell	300 m		
emissions	50 m		
nuisance			

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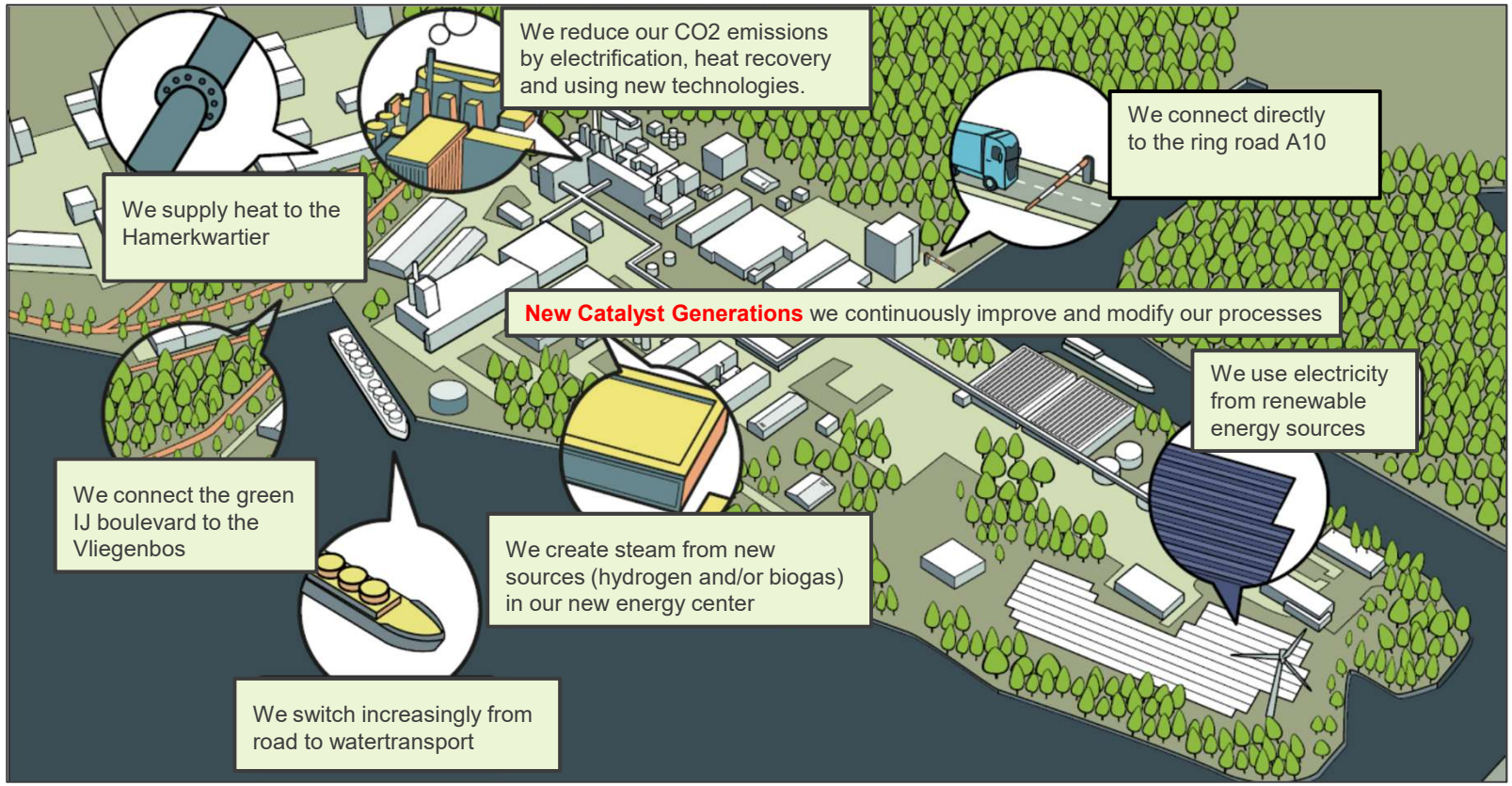
= relevant aspect at height

= relevant aspect

Customization to Albemarle's future; *we have a strategy*



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Key learnings for good and sustainable cooperation

- Involve all stakeholders from the early beginning
  - Integration of a chemical plant in the design of a municipal area is a time consuming and complex process.

- Follow an integral approach in pursuing the optimal mix of all interests:
  - City development plans for ‘a compact city’
  - Continuation of Albemarle’s operation
  - Sustainable (climate neutral and circular) development of both the city of Amsterdam and Albemarle
  - Tourism and water recreation

- Explore innovations for sustainable integration with added value
  - Sustainable energy (heat) supply by Albemarle to the city
  - More water, less road transport and traffic

‘Living and working together’ requires customization and therefore close cooperation between the city of Amsterdam and Albemarle

Key learnings for good en sustainable cooperation

- Consider phased development and ‘spare’ space for flexible future development
  - Our joint sustainable future is bright, but the road to the future is not clear and paved……. Therefore we’ll need to deal with uncertainties.
  - Technological innovations in the future can be beneficial to both Albemarle and the city.

- Work together with a common set of values!

‘Living and working together’ requires customization and therefore close cooperation between the city of Amsterdam and Albemarle

Thanks for your attention!

More information about our Amsterdam operations you can find on our website
www.albemarle.nl

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Snapshot of the Catalysts business

Characteristics

- Leading positions in FCC and HPC catalysts - produced in Amsterdam, Houston and JV's
- High capital intensity [large plants], requiring strong technical and application expertise
- Highly engineered and customized materials
- Focused on value creation for refiners

- **FCC Catalysts** contain alumina, silica, and rare earth metals

  Hydroprocessing Catalysts contain Aluminum, Cobalt*, Nickel

*The industry has looked for replacement of Cobalt for decades, but nothing comes close

Fluid Cracking Catalysts (FCC)

FCC Catalysts

- Cracks oil feedstock into gasoline and chemicals
- Albemarle is a leader in the FCC market in 1) bottoms cracking; 2) olefins output; and 3) emerging markets

Hydroprocessing Catalysts (HPC)

HPC

- Removes sulfur and contaminants to produce clean transportation fuels
- Albemarle is a leader in the HPC market in
  1) diesel
  2) bio-based oil and hydro-cracker oil pretreatment; and
  3) deep hydrotreating catalysis

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A Snapshot of Albemarle

Lithium	Catalysts	Bromine Specialties
38% of Total Revenue	30% of Total Revenue	28% of Total Revenue

REVENUE BY GEOGRAPHY

26% North America	23% EMEA	50% Asia (13% in China)	1% ROW

FINANCIAL HIGHLIGHTS

	2017	2018	2019
NET SALES	$3.072B	$3.375B	$3.589B
NET INCOME attributable to Albemarle Corporation	$55M	$694M	$533M
Adjusted EBITDA[1]	$885M	$1,007M	$1,037M
Diluted earnings per share	$0.49	$6.34	$5.02
Adjusted diluted earnings per share[1]	$4.59	$5.48	$6.04

[1] Non-GAAP measure. See Non-GAAP Reconciliations in Exhibit 99.1 of the Current Report on Form 8-K filed on February 19, 2020 and Exhibit 99.1 of the Current Report on Form 8-K filed on February 20, 2019 for reconciliations to the most directly comparable financial measure calculated and reported in accordance with U.S. GAAP.

Global Speciality CHEMICALS COMPANY Founded 1887

CORPORATE HEADQUARTERS Charlotte, NC

Approximately 5,600 EMPLOYEES Worldwide

CUSTOMERS in approximately 75 COUNTRIES

2019 DIVIDEND PAYOUT RATIO 29%

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