

Chemicals trends analyzer

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Global chemicals outlook 2030: Global chemicals market is expected to grow at a compounded annual growth rate of 3.9% from 2015 to 2030.

Market overview and outlook

Specialty chemicals

Market size by 2020 **US\$470 billion**

- ▶ Specialty chemicals is driven by increased demand in end-user industries such as construction, automotive and electronics.
- ▶ Industrialization in Asia-Pacific supplemented by low labor cost and economic growth also drives demand.

Petrochemicals

Market size by 2020 **US\$885 billion**

- ▶ Low crude oil prices coupled with growing demand from end-user industries including construction, packaging, transportation, textile, plastics and health care is expected to drive the demand for global petrochemicals industry.
- ▶ Government initiatives in India and China for establishing petrochemical complexes will drive the demand. However, shift towards bio-based chemicals can hamper the growth.

Fertilizers and Agrochemicals

Market size by 2020 **US\$195 billion**

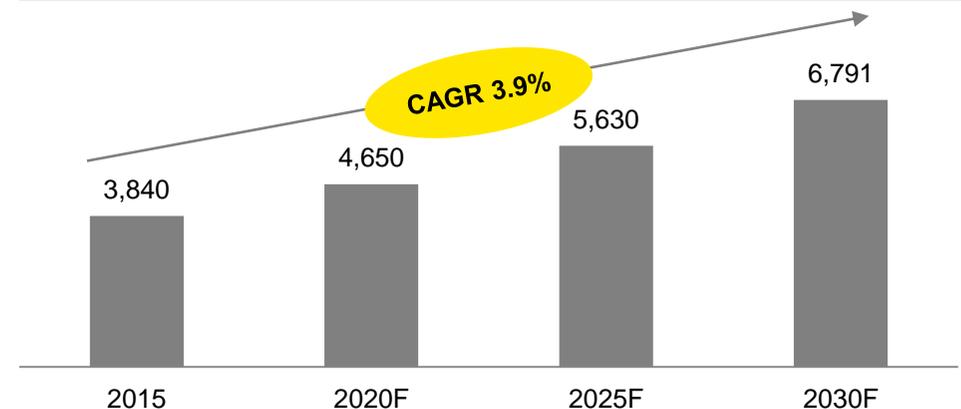
- ▶ Fertilizers and agrochemicals industry will be driven by agricultural income in emerging countries, international trade patterns, environmental laws and increasing end-user demand.
- ▶ New technologies such as agricultural biotechnology, genomics and organic farming will facilitate change in product profiles.

Global chemicals production outlook by segment (% change y-o-y)



Source: American Chemistry Council

Global chemicals sales forecast 2015–30 (US\$ billion)



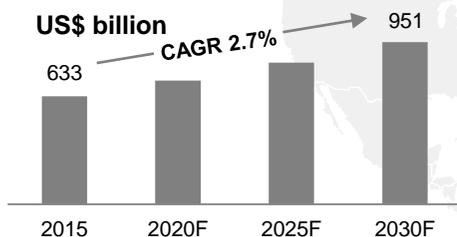
Source: CEFIC Chemdata International 2016

Global chemicals outlook 2030: Europe's market share to decline as sales in Asia grow; North America's shale gas production likely to get a boost owing to a favourable stance of the new US Government

Global chemicals sales (2015): US\$3.84 trillion

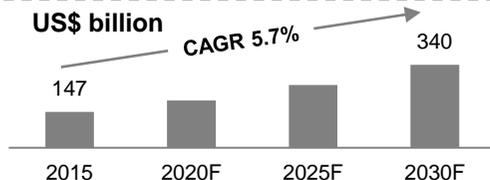
North America (16.5% market share in 2015)

- ▶ Supply-driven price decline, benefits of domestic production and shorter supply chain will spur **demand** for chemicals.
- ▶ A dynamic shift from net importer to **net exporter** is likely.
- ▶ The new US Government is likely to boost the shale gas production in the US enabling the growth of the domestic chemicals industry.



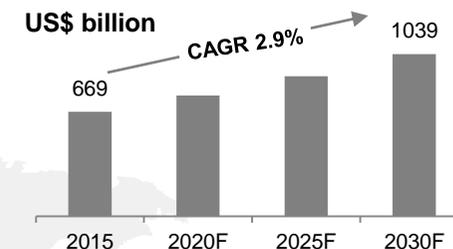
Latin America (3.8% market share in 2015)

- ▶ **Boost in investment projects** in Brazil is driven by low-cost shale gas in North America.
- ▶ Steady economic growth coupled with demand for chemicals and finished goods makes Latin America an **attractive export option for North America**.



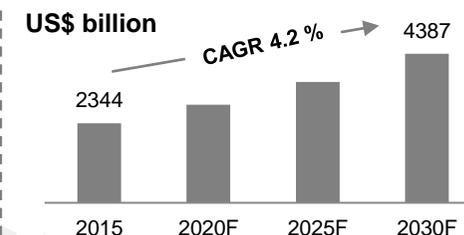
Europe (17.4% market share in 2015)

- ▶ Absolute sales are increasing, but the share of the chemicals market is **declining sharply**.
- ▶ Share in global chemicals sales is expected to decrease from 17.4% in 2015 to 15.3% in 2030.
- ▶ Post Brexit, the industry may witness a slight slowdown in growth over the next couple of years owing to drop in chemicals trade and direct investments.



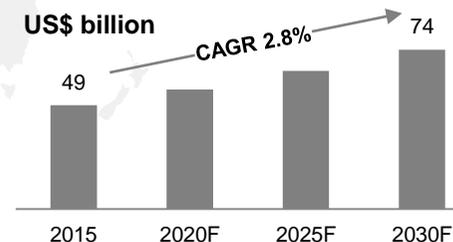
Asia (61% market share in 2015)

- ▶ Asia's global market share to reach **64.6% in 2030**.
- ▶ **Capacity expansion** coupled with **rising consumer purchasing power** will drive the demand for chemicals.
- ▶ China's demand growth is weaker than the past but it still offers an attractive destination with 40% share of the market in 2015.



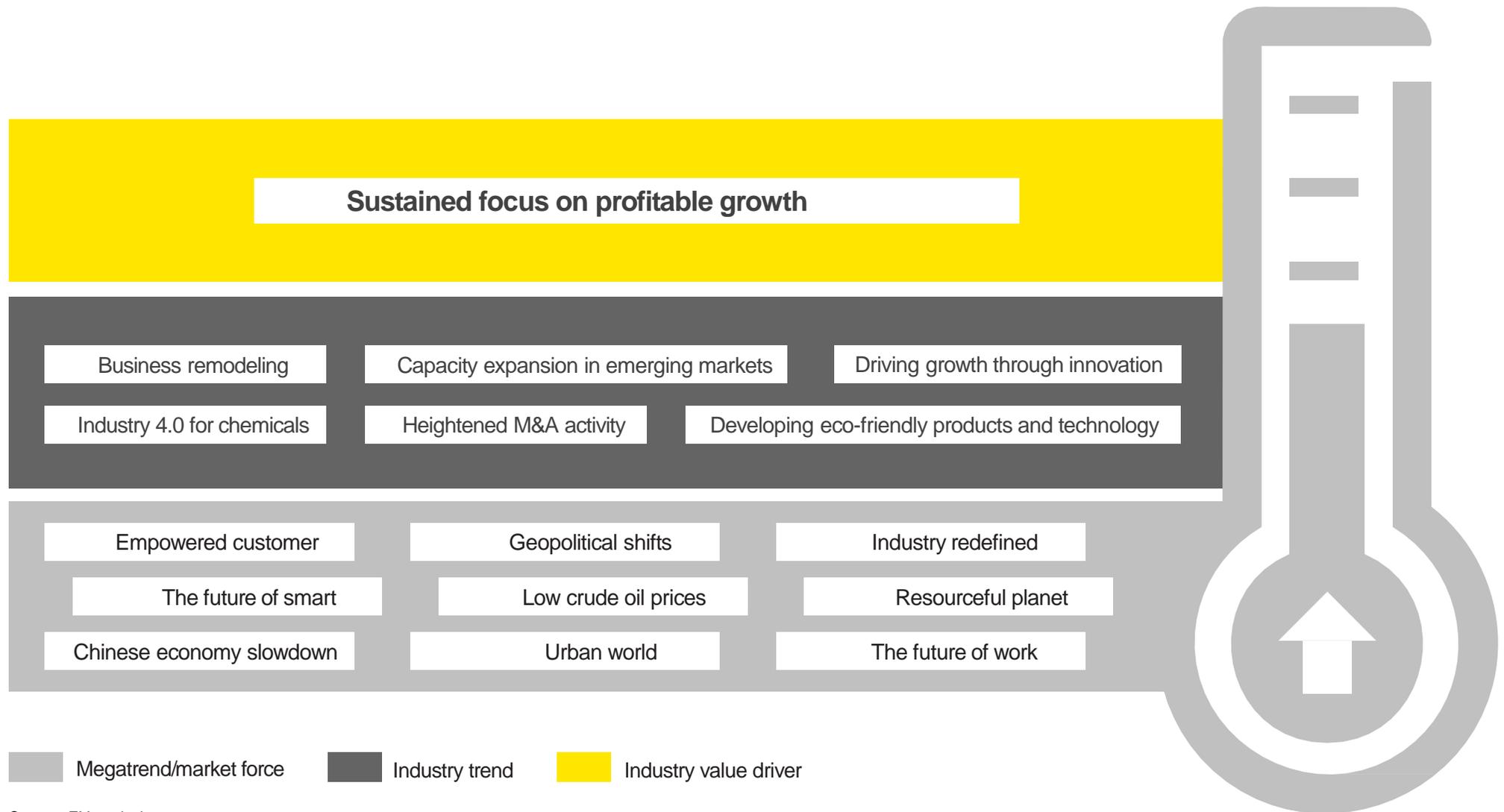
Rest of the world (1.3% market share in 2015)

- ▶ **GCC expected to become less competitive** in ethylene production with the entry of low-cost shale gas in the US.
- ▶ Driven by various mega projects in the Middle East, there would be **increasing demand for construction chemicals and materials**, such as paints and coatings, concrete admixtures, adhesives and sealants, etc.



Source: CEFIC Chemdata International 2016

To maintain the profitability in a volatile global environment, the global chemicals industry has been experiencing six major trends during the recent years



Source: EY analysis

The activities of chemicals companies reflect these industry trends including business remodeling, industry 4.0 for chemicals, innovation, eco-friendly technology, M&A and capacity expansion in emerging markets

Megatrends	Industry redefined		Empowered consumer		Geo-political shifts	
	The future of work	Resourceful planet	Urban world	The future of smart		
Industry trends	<u>Business remodeling</u>	<u>Industry 4.0 for chemicals</u>	<u>Capacity expansion in emerging markets</u>	<u>Heightened M&A activity</u>	<u>Driving growth through innovation</u>	<u>Developing ecofriendly products and technology</u>
What companies are doing?	Emphasis on customer and focused product portfolios	Using big data to forecast demand, supply and prices	Downstream expansion	Divesting non-core businesses to streamline portfolio	Investing in R&D to discover renewable sources of raw material	
	Operational excellence to improve EBITDA and accomplish cost leadership	Chemicals distributors buying and selling products through a digital market place	Expanding geographical footprint through organic growth	Acquiring businesses aligned to company's core businesses	Expanding renewable products portfolio	
	Automating manufacturing processes, implementing continuous performance improvement initiatives through the Industrial Internet of Things	Producing the materials used in 3D printing such as ABS plastic, photopolymers etc.	Improving cost structure	Increased interest of PE firms in chemical companies with strong product innovation and eco-friendly product portfolio	Developing smart chemical products for use in smart homes, textiles, wearables	Conducting research in partnership to develop sustainable manufacturing processes and technology
	Supply chain optimization, integration with suppliers and customers	Using additive manufacturing or 3D printing for prototyping and manufacturing products	Delivery time minimization through presence across geographies	Acquiring/merging with competitors to enhance market presence	Using drones for inspection of chemical plants	Switch to renewable fuel sources such as biofuel and biogas

Source: EY analysis

How do the trends impact different industry segments in the long term?

Industry trends/market forces	Bulk petrochemicals	Fertilizers	Agrochemicals	Specialty chemicals and plastics	Inorganic chemicals
Business remodeling					
Industry 4.0 for chemicals					
Capacity expansion in emerging markets					
Heightened M&A activity					
Driving growth through innovation					
Developing eco-friendly products and technology					
Declining oil prices driving down petrochemical prices and thereby producers' margins					
Alternate strategies for petrochemical production from low-cost feedstock					

Source: EY analysis



Maximum impact



Negligible or zero impact

Business remodeling: In order to further drive the growth and profitability, chemical companies are remodeling their businesses in accordance with current business environment

Steps taken by companies to remodel their businesses

1

Cost structure improvement

- ▶ SABIC designed a new feed stock system to counter gas supply shortage in the kingdom to boost domestic growth. SABIC reduced costs by 18% and increased production by 3% between 1Q16 and 2Q16, as it targeted to improve the efficiency in petrochemical production. (2016).

2

Customer focus

- ▶ Keeping in mind the customer preference, BASF combined separate sales units of its adhesive division. (2015)
- ▶ To strengthen its product portfolio, BASF added new products in water-based polyurethanes market. (2016).

3

Portfolio extension

- ▶ DuPont Biosciences entered into the biogas sector by launching a new enzyme product that will help bio methane producers improve biogas yields and robustness (2016).

4

Sustainable solution

- ▶ Dow Chemical introduced its Dow Filmtec Fortilife for reverse osmosis and Nano filtration line to meet customer needs in challenging waters across various markets such as fossil power generation, chemicals, petrochemicals, metals and textiles (2016).

5

Focus on core business/divesting non-core businesses

- ▶ AkzoNobel acquired the BASF's industrial coatings business for €475 million to strengthen its focus on decorative paints business (2016).
- ▶ Covestro intends to close its MDI-production facility in Spain by 2017 and open a chemical logistics park.

Pros

- ▶ Divesting low-performing/non-core businesses
- ▶ Increased investment in R&D and product innovation
- ▶ Increased innovation in developing sustainable products and processes
- ▶ Shifting to high-margin segments and high-growth regions

Implications for chemicals players

- ▶ Increased costs from restructuring/acquisition/R&D investment
- ▶ Divesting commodity businesses might adversely impact availability of low-cost raw material for specialty/downstream businesses (for integrated players)
- ▶ Attaining post-acquisition integration or M&A synergies

Cons

Industry 4.0 for chemicals: The current trend of automation and data exchange is disrupting the chemicals industry, making it smart and swift

Initiatives of companies in the space of Industry 4.0

1 Big data-supply chain

- ▶ Dow is investing heavily in a transportation management system based on SAP to streamline its supply chain and logistics processes and get better, near-real-time visibility into goods in transit (2016).
- ▶ BASF, in collaboration with a Dutch start-up company, plans to launch a new pallets concept in the logistics market that will help the company to monitor location, temperature, and load state (2016).
- ▶ DuPont is using big data analytics to significantly refine the decision-making process for choosing the potentially higher-yielding soybean varieties for future development. (2016).

2 Internet platform

- ▶ BASF launched Maglis, an online platform, to help farmers improve crop management (2016).
- ▶ Bayer's new digital customer portal provides farmers and dealers with advice and up-to-date information (2016).
- ▶ Bayer developed a new cap seal to protect users against counterfeit crop protection products. Scanning the code with the interactive smartphone app from Bayer gives the user important information about the authenticity of the product (2016).

3 Internet of things

- ▶ AkzoNobel inaugurated the first virtual reality technology facility which enables customers to view product innovations before they go to the market (2016).
- ▶ Dow Chemicals deployed drones in its chemical plants to inspect the plants and increase safety at a very minimal cost when compared with inspection through helicopters, telescopes etc.,. The company also uses similar drones to inspect its chemical storage tanks to check for cracks or seal problems (2016).

Pros

- ▶ The industry 4.0 results in company's cost reduction and at the same time makes the company flexible.
- ▶ Use of technology increases productivity of the company as it becomes more efficient.
- ▶ Industry 4.0 also helps the companies to realize their sustainability vision of growth.

Implications for chemicals players

- ▶ High initial setup costs result in long payback period.
- ▶ Interference in company operations by cost cuts in crucial activities (R&D and training)
- ▶ Loss of certain jobs as a result of automation.
- ▶ Over dependence on technology. Breakdown, if any, can be catastrophic for the whole industry.

Cons

Capacity expansion in emerging markets: Chemicals companies are increasing their production capacity in emerging economies in a bid to take production closer to the customer

Companies are taking varied measures to increase capacity in emerging markets

Company	Deal year	Target country	Target segment	Description	Rationale
BASF	Sep 2016	Korea	Specialty plastics	Additional production line for Ultrason polyarylsulfone in Korea.	To serve growing demand of high-performance specialty plastics.
Solvay	Sep 2016	China	Semi-conductors	Commissioning of hydrogen peroxide production plant	To support growing demand of semiconductor industry in China
AkzoNobel	Aug 2016	India	Paints and coatings	New powder coatings plant in Mumbai, India with an investment of €9 million	To support growing demand of paint and coatings industry in India
BASF	Aug 2016	Sri Lanka	Construction chemicals	Production for custom-made performance-based construction chemicals.	To support growing demand of construction chemicals in Sri Lanka
SABIC	May 2016	China	Diversified chemicals	Construction of coal-to-chemical production house	Strengthening company's portfolio in China
DuPont	Apr 2016	China	Thermo-plastics	Launch of engineering compound facility	Strengthening company's portfolio in China

Pros

- ▶ Increased profitability with more specialized and customized products
- ▶ Strengthened strategic positions (for existing chemicals players)

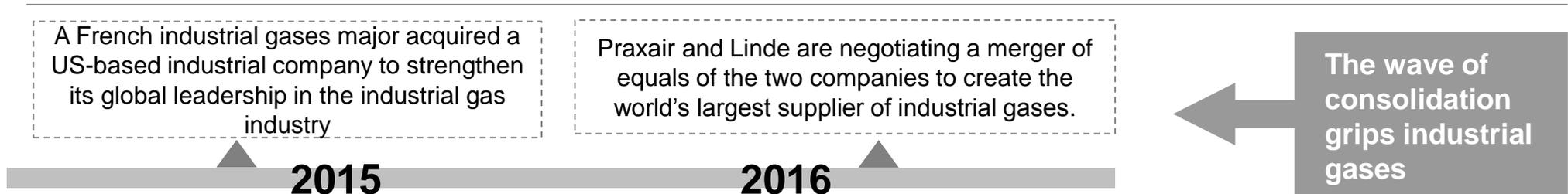
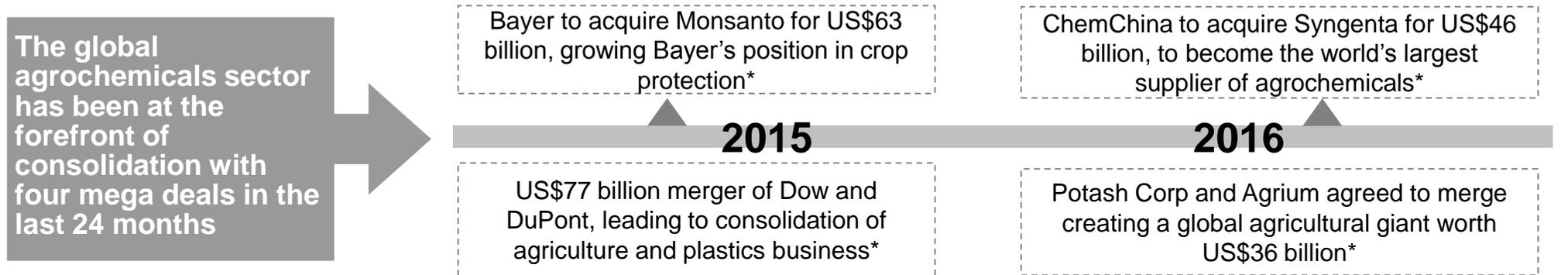
Implications for chemicals players

- ▶ Post expansion, acquisition and JV integration issues
- ▶ Competition from domestic producers in case of cross-border expansion

Cons

Heightened M&A activity: Over the last couple of years, the global chemicals industry has seen a sudden increase in M&A activity as the industry is aggressively pursuing growth

Chemical M&As by deal value have almost tripled between 2011 and 2016 with the recent trend being towards megadeals and consolidation; Agrochemicals and industrial gases are the most impacted.



Pros	Implications for chemicals players	Cons
<ul style="list-style-type: none"> ▶ Decrease in competition as the barriers to entry in the segment increases because of presence of big players. ▶ Reduced impact of feedstock price fluctuations (such as oil price) as the merged companies enable supply chain synergies. 	<ul style="list-style-type: none"> ▶ Post acquisition and JV integration issues ▶ Competition from domestic producers in case of cross-border deals ▶ Cost challenges of divesting backward-integrated businesses 	

* The deal is yet to be completed

Driving growth through innovation: To achieve margin growth, chemicals companies have been constantly launching innovative products, reinventing processes and business models

Sustainable profitable growth through innovation

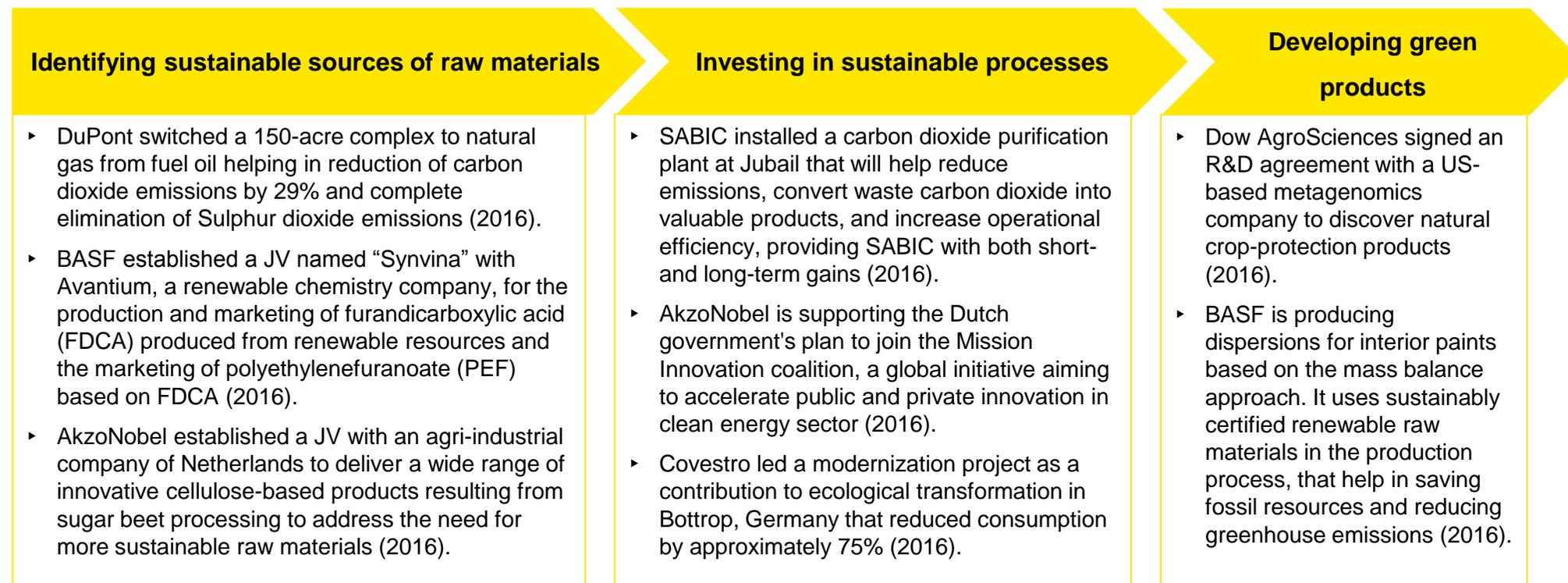


Some examples of investments in innovation

- ▶ Solvay and Petroleum Institute research center established an automated chemical enhanced oil recovery (EOR) formulation laboratory in Abu Dhabi (2016).
- ▶ BASF opened an R&D centre with an investment of €514 million for biological crop protection and seed solutions in Germany. BASF projects its crop protection pipeline to achieve peak sales of €3 billion for products launched between 2015 and 2025. (2016).

Pros	Implications for chemicals players	Cons
<ul style="list-style-type: none"> ▶ Innovative ideas lead to increase in productivity of the company as it becomes more efficient. ▶ Innovation leads to development of new services and business models. ▶ It will enable optimum returns on R&D investment. ▶ Innovation also helps the company to minimize its operational risks. 		<ul style="list-style-type: none"> ▶ Interference in company operations by cost cuts in crucial activities (R&D and training) ▶ Loss of certain jobs as a result of automation. ▶ Increased costs of remodeling technology and processes

Developing ecofriendly products and technology: Companies are increasingly investing in eco-friendly processes, technologies and futuristic products to ensure sustainable growth



Pros	Implications for chemicals players	Cons
<ul style="list-style-type: none"> ▶ Boosts product innovation, thereby helping the company's R&D position in the market ▶ M&As and alliances with renewable energy or raw material providers ▶ Ease of access to markets with more stringent regulations 		<ul style="list-style-type: none"> ▶ Limited expertise in the market for green products, processes and technology imply increased HR costs ▶ Cost competitiveness with conventional feedstocks as costs increase for remodeling technology and processes ▶ Opportunity cost of agricultural and biological feedstock as it also has usage in the food industry

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