Chemicals trends analyzer

6 June 2017
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)

<table>
<thead>
<tr>
<th>Segment</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural chemicals</td>
<td>3.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Inorganics</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Bulk Petrochemicals and Organics</td>
<td>2.1</td>
<td>3.5</td>
</tr>
<tr>
<td>Plastic resins</td>
<td>3.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Synthetic rubber</td>
<td>3.4</td>
<td>2.8</td>
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<td>Man-Made Fibers</td>
<td>4.1</td>
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<td>3.8</td>
<td>3.3</td>
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</tbody>
</table>

Source: American Chemistry Council

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

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2020F</th>
<th>2025F</th>
<th>2030F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrochemicals</td>
<td>3,840</td>
<td>4,650</td>
<td>5,630</td>
<td>6,791</td>
</tr>
<tr>
<td>Fertilizers and Agrochemicals</td>
<td>2015</td>
<td>2020F</td>
<td>2025F</td>
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</table>

CAGR 3.9%

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.

- **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.

- **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.

- **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:

- Business remodeling
- Capacity expansion in emerging markets
- Driving growth through innovation
- Industry 4.0 for chemicals
- Heightened M&A activity
- Developing eco-friendly products and technology

- Empowered customer
- Geopolitical shifts
- Industry redefined
- The future of smart
- Low crude oil prices
- Resourceful planet
- Chinese economy slowdown
- Urban world
- The future of work

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.

<table>
<thead>
<tr>
<th>Megatrends</th>
<th>Industry trends</th>
<th>What companies are doing?</th>
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<tbody>
<tr>
<td>Industry redefined</td>
<td>Business remodeling</td>
<td>Emphasis on customer and focused product portfolios</td>
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<td>Industry 4.0 for chemicals</td>
<td>Using big data to forecast demand, supply and prices</td>
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<td>Capacity expansion in</td>
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<td>Supply chain optimization, integration with suppliers and customers</td>
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</table>

Source: EY analysis
How do the trends impact different industry segments in the long term?

<table>
<thead>
<tr>
<th>Industry trends/market forces</th>
<th>Bulk petrochemicals</th>
<th>Fertilizers</th>
<th>Agrochemicals</th>
<th>Specialty chemicals and plastics</th>
<th>Inorganic chemicals</th>
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<tbody>
<tr>
<td>Business remodeling</td>
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<td>Developing eco-friendly products and technology</td>
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<tr>
<td>Declining oil prices driving down petrochemical prices and thereby producers’ margins</td>
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<tr>
<td>Alternate strategies for petrochemical production from low-cost feedstock</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Steps taken by companies to remodel their businesses</th>
<th>Implications for chemicals players</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost structure improvement</strong></td>
<td></td>
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<tr>
<td>• SABIC designed a new feedstock 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).</td>
<td>• Increased costs from restructuring/acquisition/R&amp;D investment</td>
<td>• Divesting low-performing/non-core businesses</td>
<td></td>
</tr>
<tr>
<td><strong>Customer focus</strong></td>
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<tr>
<td>• Keeping in mind the customer preference, BASF combined separate sales units of its adhesive division. (2015)</td>
<td>• Divesting commodity businesses might adversely impact availability of low-cost raw material for specialty/downstream businesses (for integrated players)</td>
<td>• Increased investment in R&amp;D and product innovation</td>
<td></td>
</tr>
<tr>
<td><strong>Portfolio extension</strong></td>
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<tr>
<td>• 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).</td>
<td>• Attaining post-acquisition integration or M&amp;A synergies</td>
<td>• Increased innovation in developing sustainable products and processes</td>
<td></td>
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<tr>
<td><strong>Sustainable solution</strong></td>
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<tr>
<td>• 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).</td>
<td></td>
<td>• Shifting to high-margin segments and high-growth regions</td>
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</tr>
<tr>
<td><strong>Focus on core business/divesting non-core businesses</strong></td>
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<tr>
<td>• AkzoNobel acquired the BASF’s industrial coatings business for €475 million to strengthen its focus on decorative paints business (2016).</td>
<td></td>
<td>• To strengthen its product portfolio, BASF added new products in water-based polyurethanes market. (2016).</td>
<td></td>
</tr>
<tr>
<td>• Covestro intends to close its MDI-production facility in Spain by 2017 and open a chemical logistics park.</td>
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</tbody>
</table>
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

**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).

**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).

**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).

<table>
<thead>
<tr>
<th>Pros</th>
<th>Implications for chemicals players</th>
<th>Cons</th>
</tr>
</thead>
</table>
| • 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. | • 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. |
**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**

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

**Implications for chemicals players**

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

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Deal Description</th>
<th>Deal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Potash Corp and Agrium agreed to merge creating a global agricultural giant worth US$36 billion*</td>
<td>US$36 billion</td>
</tr>
<tr>
<td>2016</td>
<td>ChemChina to acquire Syngenta for US$46 billion, to become the world’s largest supplier of agrochemicals*</td>
<td>US$46 billion</td>
</tr>
<tr>
<td></td>
<td>Bayer to acquire Monsanto for US$63 billion, growing Bayer’s position in crop protection*</td>
<td>US$63 billion</td>
</tr>
<tr>
<td></td>
<td>US$77 billion merger of Dow and DuPont, leading to consolidation of agriculture and plastics business*</td>
<td>US$77 billion</td>
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The global agrochemicals sector has been at the forefront of consolidation with four mega deals in the last 24 months:

- A French industrial gases major acquired a US-based industrial company to strengthen its global leadership in the industrial gas industry.
- Praxair and Linde are negotiating a merger of equals of the two companies to create the world’s largest supplier of industrial gases.

Implications for chemicals players:

**Pros**
- 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.

**Cons**
- 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

The wave of consolidation grips industrial gases.

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**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.
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

- 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.
- 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

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).

Implications for chemicals players

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

Identifying sustainable sources of raw materials

- DuPont switched a 150-acre complex to natural gas from fuel oil helping in reduction of carbon dioxide emissions by 29% and complete elimination of Sulphur dioxide emissions (2016).
- BASF established a JV named “Synvina” with Avantium, a renewable chemistry company, for the production and marketing of furandicarboxylic acid (FDCA) produced from renewable resources and the marketing of polyethylenefuranoate (PEF) based on FDCA (2016).
- AkzoNobel established a JV with an agri-industrial company of Netherlands to deliver a wide range of innovative cellulose-based products resulting from sugar beet processing to address the need for more sustainable raw materials (2016).

Investing in sustainable processes

- SABIC installed a carbon dioxide purification plant at Jubail that will help reduce emissions, convert waste carbon dioxide into valuable products, and increase operational efficiency, providing SABIC with both short- and long-term gains (2016).
- AkzoNobel is supporting the Dutch government’s plan to join the Mission Innovation coalition, a global initiative aiming to accelerate public and private innovation in clean energy sector (2016).
- Covestro led a modernization project as a contribution to ecological transformation in Bottrop, Germany that reduced consumption by approximately 75% (2016).

Developing green products

- Dow AgroSciences signed an R&D agreement with a US-based metagenomics company to discover natural crop-protection products (2016).
- BASF is producing dispersions for interior paints based on the mass balance approach. It uses sustainably certified renewable raw materials in the production process, that help in saving fossil resources and reducing greenhouse emissions (2016).

Implications for chemicals players

Pros

- 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

Cons

- 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
References

References

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