



IEBS Industry Outlook 2020

Chemical Sector

December 31, 2020

Mega Trends in the Chemical Sector

The **chemical sector** is expected to undergo **consistent advancement** in the next decade. Chemical companies must quickly adapt to the changing market dynamics to gain a **competitive edge** in the market and embrace **new market opportunities**. The three **major mega trends** which can be seen in the chemical sector are indicated below:



#1 - Sustainability & circular economy

- Focus on **raw material substitution** and **maximizing the use of renewables, energy recovery, recycling, reuse by end-users** to achieve the objective of **circular economy** to maximize value and conserve resources.
- Few examples indicated are - **bio-based plastic, battery material recycling, alternative sources** of energy or **power generation (wind energy)**.



#2 - Digitalization

- Digitalization** will help chemical companies in several ways such as **capturing critical data** and drawing insights to achieve **improved output at lower cost**.
- For example:**
 - AI to drive efficiency
 - Sensors and IoT to transform logistics
 - Collaboration with tech giants to remain ahead of the curve
 - Machined to perfection



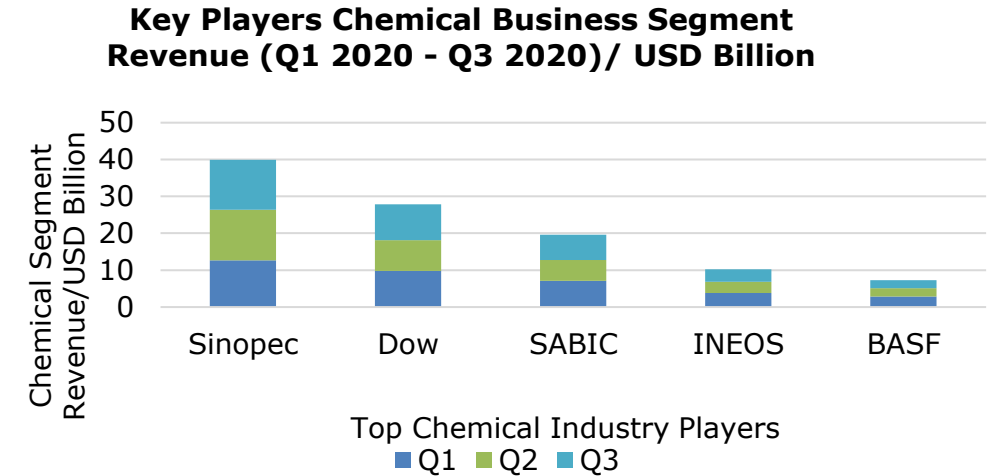
#3 - Innovation & accelerated globalization

- Demand for chemicals to grow consistently in emerging markets. Majority of M&A deals in chemical sector take place between companies offering commodities and intermediates & specialty materials.
- Following innovations taking place:**
 - Novel manufacturing process
 - Making composites affordable
 - Advanced material for better insulation

Performance Highlights of Chemical Sector in 2020

Key Players Performance in the Chemical Sector in 2020

S No.	Company Name	Q1/Chemicals	Q2/Chemicals	Q3/Chemicals
1	Sinopec	12.66	13.72	13.58
2	Dow	9.77	8.35	9.71
3	SABIC	7.086	5.689	6.808
4	INEOS	3.835	3.022	3.368
5	BASF	2.871	2.188	2.185



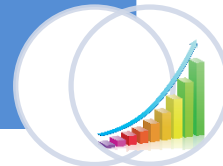
•In **2020**, most players even the large-scale players witnessed a **decline** in their **sales/revenue** in the **Q2** mainly due to the immediate impact of **COVID-19** leading to **supply chain disruptions** caused by **ban at the borders** and **factory shutdowns**.

Decline in Q2 Sales in Chemical Sector



•As indicated above, companies showcased **recovery in Q3 of 2020** with **loosening of lockdown** and **resuming of factory operations** and **smooth functioning of supply chain** in the **chemical sector**.

Recovery in Q3 2020 in Chemical Sector



•Growing tension between the **U.S.** and **China** along with the pandemic situation of national shutdowns has **questioned globalization** across many industrial sectors. Several institutional investors asking companies if they can **ringfence Chinese operations** and **re-base supply chains** for the **U.S.** and **Europe** closer to **their markets**.

Deglobalization & supply chain localization



•**Chemical sector** is a **slow mover** when it comes to **digitalization**. However, COVID has showcased the power of digital through remote working and operations of plant control systems.

•**Greater adoption** of **artificial intelligence (AI)**, **machine learning (ML)**, **robotic process automation (RPA)** and other technologies.

Digitalization in the Chemical Sector



Note – The results of Q4 2020 are not yet published by the key players in the chemical sector.

Emerging Areas or Opportunities in The Chemical Sector

The **development** and **applications** of **innovative advance materials** is need of every industry which has been tackled by nanomaterials and many more research and development is being made on nanomaterials, **better mechanical and chemical properties** of nanomaterials are the major reason of industries shifting towards it. **Nanomaterials** is emerging sector of chemical industry which have many opportunities or emerging areas few important **emerging areas of nanotechnology** or nanomaterials are following:

EMERGING AREAS OF NANOMATERIALS

Nano Catalyst

- This is rapidly growing area which involves the use of **nanomaterials** as a **catalyst** in **chemical reactions**, due to their nanometer size they consist **complex properties** which **increase** their **active centers** for **reactions** of reactants also their extremely small size provides enormous surface area to volume ratio.
- **Nano catalyst** are also **cost efficient** than **metal catalyst**. The above properties of nano catalyst are working as driving force of use of nano materials as catalyst

Chemical Sensors

- **Nanomaterials** can help **sensors** to in detection of very small number of chemical vapors, because of the **small size** of nanoparticles a few molecules are sufficient to identify a small changes.
- Many nanomaterials are under R&D to be use in sensors.
- In the age of **industry 4.0** **small and efficient sensors** are playing a vital role which can be achieved by **nanoparticles** which is driving force for **developments of two-dimensional nano particles** for sensors.

Graphene

- **Graphene** is a **carbon nanomaterials** which serves many **end-use applications** such as **anti-corrosion coatings and paints, efficient and precise sensors, faster and efficient electronics, flexible displays, efficient solar panels, faster DNA sequencing, drug delivery**, and more.
- Graphene as better **thermal and electrical conductivity , elasticity and flexibility, hardness, resistance** and many more which is **shifting industries** towards using **graphene** in various **process**.

Policy Updates in The Sector

The **European Union** already has one of the most comprehensive and **protective regulatory frameworks** for **chemicals**, supported by the most advanced knowledge base globally **European Commission** has come with **new policy** for **zero chemical pollution** in the environment few major pointers of policy are following:

01

The **Commisison** will propose **new hazard classes** and criteria in the CLP regulation to fully address **environmental toxicity, persistency, mobility and bioaccumulation**.

The **Commisison** will introduce **endocrine disruptors, persistent, mobile and toxic and very persistent** and **very mobile substances** as categories of substances of very high concern.

02

03

The **Commisison** will ensure that the information made available to authorities on substances allows comprehensive **environmental risk assessments** by strengthening requirements across legislation.

Major Technology Trends in The Sector

01

INTERNET OF THINGS (IoT) SOLUTIONS

The **demand of IoT (Internet of Things)** solutions in the **chemical industry** is achieving an expeditious growth because of the burning requirement of **efficiency in chemical production** and the need of **addressing the risk of plant**, and workers associated with **industrial activities**.

IoT is also helping in building a framework of **machine learning**. It is also capable of capturing **real time data** and **operation parameters, product quality** and so on, with the help of these capabilities IoT can bring a **flexibility** in **chemical production plants** to achieve **better productivity**.

02

NANOTECHNOLOGY

Chemical industry and **nanotechnology** cannot be considered separately from each other, as several areas of nanotechnology exist because of the **essential chemical** that provide **mechanisms and phenomena to nanotechnology**.

Several polymers that are created within the chemical industry still comprise the dominion of nanotechnology, especially when they are squeezed at the nanoscale, even if the material is not made out of it. Firms like **DuPont** have created many such polymers like **Kevlar** and **Teflon**, which are inspired from **nanotechnology**.

03

ZERO WASTE FACTORS

The **increasing demand** and the impact of **waste disposal** on **environment** has encouraged to set stringent regulations. Going **zero waste** is one such **sustainable** step, with the right utilization of tools, it can **cut costs** and **speed up production efficiency**.

By **less energy** and **resource consumption**, global chemical companies are now ensuring sustainability. The sustainable ecosystem includes **chemical production, applications, raw materials, and end-users** with the main focus on **increasing maximum use of renewables, recycling, energy recovery, and re-use**.

Disclaimer

Information provided in this document is based on sources believed to be reliable and correct. There is no warranty/liability associated with the errors, omissions or inadequacies in the information. Under no circumstances will Ingenious e-Brain Solutions or its personnel be liable or responsible for any direct, indirect, incidental, consequential, special, exemplary, punitive or other damages, arising out of or in any way relating to the information contained herein or its interpretation thereof.



Contact details

Email:- services@iebrain.com

Web:- www.iebrain.com



INDIA

207-208, 2nd Floor, Welldone
Tech Park Sohna Road, Sector 48
Gurugram, Haryana 122018,
Phone - +91 124 429 4218



USA

4 Heinrich Way
Bridgewater, New Jersey
Phone - + 1 347 480 2054



UK

13 Freeland Park, Poole, Dorset,
United Kingdom, BH16 6FH
Phone - + 44 207 193 3548



Thank You !

Ingenious e-Brain Solutions

*Ingenious e-Brain Solutions provides high-quality, customized and cost-effective Intellectual Property Research, Business Research and Market Research solutions to industry leaders, law firms and innovative companies across the globe. Innovation, knowledge and transparency form the basis of our company's mission and vision. Along with cost benefits, we provide highest quality **patent search** results ensuring fool-proof confidentiality and security. Since our inception, we have conducted patent studies covering over 100 jurisdictions. We are an ISO certified company with offices in India and USA.*

*Ingenious e-Brain Solutions has a strong team of Patent Analysts with domain proficiency which is devoted to help clients grow. Our highly qualified professionals offer tailored, value-added and cost-effective **patent services** to our clients. We believe in building long term relationships with our clients who include national and international corporations, Fortune 500 companies, world's leading research institutes and universities as well as independent inventors.*