SULPHATE REMOVAL AND CONCENTRATION SYSTEM (SRCS) & ANHYDROUS SODIUM SULPHATE RECOVERY SYSTEM (ANSS)

SepraTECH Solutions’ Sulphate Removal and Concentration System (SRCS) is a membrane-based skid mounted plug & play system which has benefitted the chlor-alkali industry for purifying depleted brine or pure brine from sulphate impurities. With decades of experience in process applications, we are dedicated to provide sound engineering solutions to clients while minimizing overall project costs and surpassing extreme quality expectations as a manufacturer and supplier of SRCS for purifying both depleted brine (NaCl – 210 ± 20 g/l) and pure brine (NaCl – 310 ± 10 g/l) from sulphate ions.

<table>
<thead>
<tr>
<th>Stream</th>
<th>Na₂SO₄ (g/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dechlorinated Depleted Salt Brine</td>
<td>10 ± 2 g/l</td>
</tr>
<tr>
<td>Permeate Low Sulfate Salt Brine</td>
<td>1.5 ± 0.5 g/l</td>
</tr>
<tr>
<td>Concentrated High Sulfate Brine</td>
<td>80 ± 5 g/l</td>
</tr>
</tbody>
</table>

**SRCS Key Advantages & Features**

- Reductions in operational expenditure, by avoiding barium precipitation chemical and recovery of valuable salt that was otherwise being purged
- Environmental benefits by reducing effluent discharge and eliminating barium sulfate solid waste disposal
- Improved electrolyser power consumption if barium is no longer used
- Easy integration with existing facilities with minimal downtime and automated PLC/SCADA operation
- Recovery of Grade A – Anhydrous Na₂SO₄ from SRCS concentrated Na₂SO₄ stream
- Complete Zero Liquid Discharge (ZLD) System

SepraTECH can also extend support and prompt after sales service for industries already having an existing SRS/SRU. We can also provide system spares and SRCS membranes for replacement.

RECENTLY BAGGED INDIA’S BIGGEST SULPHATE REMOVAL AND CONCENTRATION SYSTEM (SRCS)
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Chemicals production increased 7.75% till May 2022

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Reliance to invest in expanding capacities across polyester and vinyl value chains

**NOTIFICATIONS/PRESS RELEASES/ MEMORANDA**

1. Safeguard Initiation Notification 02/2022 dated 16th September 2022 by Ministry of Commerce (DGTR)
   
   - Safeguard (Quantitative Restrictions) investigation concerning imports of PVC suspension resins with residual VCM above 2ppm

2. Order No. S.O. 4136 (E) to 4141(E) dated 2nd September 2022, by Ministry of Chemicals and Fertilisers, Department of Chemicals and Petrochemicals
   
   - Extension of enforcement date of Quality Control Orders of 6 Petrochemicals viz.
     (i) Acrylonitrile Butadiene Styrene (ABS) (ii) Ethylene Dichloride (EDC) (iii) p-Xylene (iv) Polycarbonate (v) Polyurethanes and (vi) Vinyl Chloride Monomer

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* Expected value @ 385mbarg, 90°C and 32wt% NaOH
**Based on 350 days operation and 7kA/m²
Dear Reader,

The Annual General Meeting of AMAI was held in physical mode after a duration of two years due to the disruptions caused by Covid-19. The AGM unanimously re-elected Mr. Kapil Malhotra, Global Business Unit Head – Fluoropolymers, Gujarat Fluorochemicals Ltd. (GFL) as President and Mr. Ajay Virmani, Managing Director, Lords Chloro-Alkali Ltd. as Vice President of AMAI, both for a second term. The participation of members in the in-person AGM after a gap of two years was refreshing.

In his address to Members in the AGM, the President recalled the tough phase the industry passed through for almost two years hit by the pandemic. It was heartening that the industry had recovered and looked forward to better times with the resumption of normal business activities. The restrictions imposed by the pandemic had also affected the activities of the Association. However, the absence of physical events was partly made up by a few webinars that saw healthy participation from the industry.

The Association released its annual compilation, the Annual Industry Review for 2021-22, capturing key statistics on the industry’s performance during the last FY. Production and plant capacity utilization for caustic soda and soda ash improved. Caustic soda production reached 41.30 lakh MT and Soda ash production touched 35.50 lakh MT in 2021-22. The quantities are 16% higher than the production in the previous FY. For the second successive year, caustic soda exports exceeded imports. Soda ash imports remained high at 5.63 lakh MT, representing nearly 15% of domestic demand. Readers can procure a copy of the AMAI Annual Industry Review 2021-22 from the Association Secretariat.

Shri Arun Baroka, IAS was appointed Secretary in the Department of Chemicals & Petrochemicals. He earlier served as Additional Secretary in the Ministry of Jal Shakti. AMAI conveys its greetings and extends a warm welcome to Shri Baroka on his appointment and looks forward to his support for the growth of the chemical industry in India.

The Central Pollution Control Board (CPCB) commissioned a project on “Review of Environmental Standards of Caustic Soda Industry” and preparation of Comprehensive Industrial Document Series (COINDS) for the Indian caustic soda industry based on membrane cell technology. The interim report, based on field visits to caustic soda plants and extensive data analysis, has been submitted to CPCB. The revision of environmental standards of the caustic industry, based on the final report, is expected to be concluded in the coming few months. This is the first major exercise undertaken by CPCB for review of environmental standards & preparation of COINDS after the Indian chlor-alkali industry fully converted to the membrane cell technology under the CREP programme of the Ministry of Environment, Forest & Climate Change.

AMAI presented its pre-budget memorandum to the government, seeking an upward revision of basic customs duties on imports of caustic soda, soda ash, sodium bicarb and PVC. The Association also sought full duty exemption on imports of VCM to reduce the burden on PVC producers. Other requests include bringing duties & cesses on electricity within the ambit of GST and measures to improve availability of industrial salt for domestic alkali industry. These steps will discourage imports and improve the competitiveness & capacity utilization of domestic industry.

K. Srinivasan
Secretary General
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Election of Office Bearers of AMAI

Mr. Kapil Malhotra, Global Business Unit Head – Fluoropolymers at Gujarat Fluorochemicals Limited (GFL), was re-elected as President of Alkali Manufacturers Association of India (AMAI), the national industry body for Indian Alkali and Chloro-Vinyl industries.

A professional with over 30 years experience, Mr Malhotra has held senior leadership positions besides representing industry at august forums including as Vice Chairman of Chemical Chapter of Trade Promotion Council of India – Chemical Chapter and as an Executive Member in Indian Chemical Council.

Mr Ajay Virmani, Managing Director, Lords Chloro Alkali Limited was re-elected Vice President of AMAI. Mr Virmani has had long innings in the textiles sector before moving to chlor-alkali industry.

The two office-bearers were unanimously re-elected in the Annual General Meeting of AMAI held on 26th September 2022 in New Delhi.

About AMAI

Established in 1960 and incorporated in 1977, Alkali Manufacturers Association of India (AMAI), represents the interests of the Chlor-Alkali, Soda Ash and Chloro-Vinyl industry in India and facilitates the industry’s technological and economic growth, continuous improvement in protecting human health and environment, guided by sound science, technology and risk management principles.

30th September 2022

K. Srinivasan
Secretary General
ksrinivasan@ama-india.org
Corrosion of Polymeric Materials

Dr. S.K. Chakravorty, Consultant (Plant Engineering)

Introduction

Polymeric materials have wide applications; therefore, there are many factors that can lead to corrosion in these materials. The lifetime of a polymeric material cannot be accurately foreseen in a specific corrosive atmosphere, and so it is necessary to clearly understand the compositions and reaction mechanisms of polymeric materials.

Because polymeric materials don’t experience specific corrosion rates, they’re typically either fully corrosion-proof against a selected corrosive (within specific temperature ranges), or they deteriorate quickly. They’re attacked either by chemical processes or by solvation. Solvation causes the swelling, softening, and supreme failure of polymeric materials. Therefore, it is vital to grasp the complexities of corrosion in polymeric materials.

What Are Polymeric Materials?

First, let’s take a look at what polymeric materials are and how they behave. Polymeric materials are materials that are made of polymers. They are materials composed of huge molecules, usually based on carbon, that are formed from the chemical bonding of smaller units monomers.

Polymeric materials are often plastics, but also include elastomers. They are used to make perishable foam, renewable plastics, and even films and coatings. Several polymeric materials were developed to be used in the automobile industry, as well as for clothing and medical applications. Polymeric materials show up in everyday items like milk jugs, tires, medical instruments and edible coatings. Based on their cross-linking

| TABLE-1: Thermoplastics & Thermosetters Versus Environmental Factors |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Material       | Acids          | Alkalis        | Organic        | Water           | Oxygen         | Ionizing        | Temperature |
|                | Weak | Strong | Weak | Strong | solvents | absorption, %/24 hr | and ozone | vacuum | radiation | High | Low |
| Fluorocarbons  | intt | inrt | intt | inrt | 0.0 | inrt | decompt. | P | 550 | G-275 |
| Methyl methacrylate | R | A-O | R | A | 0.2 | R | — | P | 180 | — |
| Nylon          | G | A | R | R | 1.5 | SA | — | F | 300 | G-70 |
| Polyester (chlorinated) | R | A-O | R | R | 0.05 | R | — | — | 80 | G |
| Polyethylene (low density) | R | A-O | R | R | 0.15 | A | F | F | 140 | G-80 |
| Polyethylene (high density) | R | A-O | R | R | 0.1 | A | F | G | 160 | G-100 |
| Polypropylene  | R | A-O | R | R | <0.01 | A | F | G | 300 | P |
| Polystyrene    | R | A-O | R | R | 0.04 | SA | P | G | 160 | P |
| Rigid polyvinyl chloride | R | R | R | R | 0.10 | R | — | P | 150 | P |
| Vinyls (chloride) | R | R | R | R | 0.45 | R | P | F | 160 | — |

**Thermoplastics**

**Thermosetters**

| Epoxy (cast) | R | SA | R | R | 0.1 | SA | — | G | 400 | L |
| Phenolics    | SA | A | SA | A | 0.6 | — | — | G | 400 | L |
| Polystyrene  | SA | A | A | A | 0.2 | A | — | G | 330 | L |
| Silicones    | SA | SA | SA | SA | 0.15 | R | — | F | 550 | L |
| Urea          | A | A | A | A | 0.6 | A | — | P | 170 | L |

**NOTE:** R = resistant, A = attacked, SA = slight attack, A-O = attacked by oxidizing acids, G = good, F = fair, P = poor, L = little change.
network, polymeric materials are classified as:

1. Thermoplastics, which don’t contain cross-links. These soften upon heating and are repeatedly reshaped.

2. Thermosets, which are densely cross-linked. These soften gently and ultimately degrade upon heating.

3. Elastomers (also known as rubbers), which are gently cross-linked networks that are deformed by modest force. Special elastomers are used for erosion and cavitation resistance.

Classification of the Corrosion of Polymeric Materials

According to their attack mechanism, the corrosion of polymeric materials is often classified in the following ways:

- Disintegration or degradation of a physical nature owing to factors such as absorption, permeation, solvent action, etc.
- Oxidation, wherever chemical bonds are attacked
- Hydrolysis, wherever ester linkages are attacked
- Radiation
- Thermal degradation involving de-polymerization and re-polymerization
- Dehydration (rather uncommon)
- Any combination of the above factors.

The result of such attacks can include softening, charring, crazing, de-lamination, embrittlement, discoloration, dissolving or swelling, etc.

The corrosion of polymer matrix composites is additionally plagued by two different factors: the nature of the laminate and, within the case of thermosetting resins, the process of curing. Improper or poor curing can adversely impact corrosion resistance, whereas correct cure time and procedures can usually improve corrosion resistance.

Radiation

Polymeric materials in outside applications are exposed to weather extremes that may be extraordinarily injurious to the material. The foremost harmful weather element is exposure to ultraviolet (UV) radiation and will cause embrittlement, fading, surface cracking and chalking.

When polymeric material is exposed to direct daylight for a period of years, it usually exhibits poor impact resistance, reduced overall mechanical performance, and changes in appearance.

Because ultraviolet radiation is definitely filtered by air lots, inclement weather, pollution and other factors, the quantity and spectrum of natural ultraviolet radiation exposure is extraordinarily variable. Since the sun
is lower within the sky throughout the winter months, it's filtered through a larger atmosphere. This creates two vital variations between summer and winter sunlight. During winter months, a lot of the damaging short wavelength light is filtered out. As a result, materials sensitive to ultraviolet radiation below 320 nm would degrade only slightly, if at all, throughout the winter months.

Photochemical degradation is caused by photons or light-breaking chemical bonds. For every sort of attractive force, there's an important threshold wavelength of sunshine with enough energy to cause a reaction. Light of any wavelength shorter than the threshold will break a bond, while longer wavelengths cannot fracture it. Consequently, the short wavelength cut-off of light supply is of crucial importance. If a specific polymer is only sensitive to ultraviolet radiation light below 290 nm (the solar cut-off point), it'll never experience chemical deterioration outdoors.

The ability to resist weathering varies with the type of polymer and among grades of a specific resin. Several resin grades are obtainable with UV-absorbing additives to boost weatherability. However, the higher grades of a resin usually exhibit higher weatherability than the lower molecular weight grades with comparable additives. Additionally, some colors tend to weather better than others.

**Permeation**

All materials are somewhat porous to chemical molecules, but plastic materials tend to be an order of magnitude larger in their porosity than metals. Gases, liquids or vapours can permeate polymers. Permeation could be a molecular migration through micro-voids, either within the polymer (if the polymer is more or less porous) or between polymer molecules. In neither case is there any attack on the polymer. This action is strictly a natural phenomenon. However, permeation is harmful once a polymer is applied to line piping or instrumentation. In lined equipment, permeation may end in:

- Failure of the substrate as a result of corrosion.
- Bond failure and blistering ensuing from the buildup of fluids at the bond once the substrate is less porous than the liner or from a corrosion/reaction product if the substrate is attacked by the permeative.
- Loss of contents through the substrate and liner as a result of the ultimate failure of the substrate. (In unbounded linings, it's vital that the house between the liner as well as the support member be vented to the atmosphere to permit minute quantities of permeating vapors to flee and to stop the growth of entrapped air from collapsing the liner.)

Different polymers experience different rates of permeation; some polymers aren't plagued by permeation at all. The fluropolymers are significantly affected. There's no relationship between permeation and the passage of materials through cracks and voids, although in each case, migrating chemicals travel through the polymer from one aspect to the opposite.

The thickness of a lining affects the permeation rate. For general corrosion resistance, thicknesses of 0.010 to 0.020 inches are typically satisfactory, counting on the mix of the liner material and also the specific corrodent. Once mechanical factors like dilution to cold run, mechanical exploitation, and infiltration rates are a consideration, thicker linings may also be needed.

The rate of permeation is affected by:

- Temperature and pressure
- The concentration of permeative
- The thickness of the polymer

The density of the polymer can have an impact on the permeation rate. The thickness can usually decrease permeation by the square of the thickness. The more dense the sheet is, the lower the permeation rate. The rate of permeation is also affected by the temperature and gradient within the lining. Lowering these can cut back the speed of permeation. Lined vessels like storage tanks, which are used in closed conditions, give the most effective service.

**Absorption**

Polymers have the potential to soak up varied amounts of corrodents, especially organic liquids. This will end in swelling, cracking and penetration of the substrate of a lined part. Swelling will cause softening of the polymer, introduce high stresses and cause failure of the bond on lined elements. If the polymer has a high absorption rate, permeation is likely to happen.

Several steps can be taken to cut back absorption. Thermal insulation of the substrate can cut back the gradient across the vessel, thereby preventing condensation and the absorption of fluids. This reduces the speed and magnitude of temperature changes, keeping blisters to a minimum. The use of operative procedures or devices that limit the ratio of process pressure reductions or temperature can provide additional protection.

**Corrosion of Various Polymeric Materials:**

There are three general categories of polymers:

1-**Thermoplasts (Thermoplastic Polymers)**

Thermoplasts are long-chain linear molecules that are shaped by heat and pressures at temperatures higher than a vital temperature referred to as the glass transition temperature. Many of the properties and chemical resistance variations of polymers stem directly
from the kind and arrangement of atoms within the polymer chains. Of explicit importance and interest among thermoplasts is the class called halogens, which are found within the non-metal class. Of all the halogens, fluorines are the most negative, allowing them to powerfully bond with carbon and hydrogen atoms, but not very well with themselves. The fluorine acts as a protective shield for alternative bonds of lesser strength in a polymer chain. Besides these, the arrangement of components within the molecule, the symmetry of the structure, and therefore the polymer chains’ degree of branching are vital because of the specific components contained within the molecule.

Polymeric materials containing carbon-hydrogen bonds, like polypropene and polythene, and therefore the carbon-chlorine bonds like PVC and gas chloro-trifiuoroethylene, are totally different from a completely fluorinated compound like Teflon. The latter encompasses a much wider range of corrosion resistance.

One of the applications for plastic materials is to resist atmospheric corrosion. By having the ability to resist attack by specific corrosives in plant operations, they're also able to resist corrosive fumes in the atmosphere. Thermoplastic materials are joined by either solvent cementing, thermal fusion or by means of adhesives. The most important disadvantages of solvent cementing are the likelihood of stress cracking in the parts, and therefore the potential hazards of using low-vapour point solvents. It is tough to pick out an adhesive that may not degrade in two widely differing chemical environments. In general, the adhesives that are most immune to high temperatures typically exhibit the simplest resistance to chemicals and solvents.

The common types of thermoplastics and their uses are listed below:

- **Fluocarbons (Teflon)**—widely used for handling corrosives, including aggressive environments. Used for sleeves; seals and gaskets; wire insulation; expansion joints; lining for pipes; tapes; tubing; valve diaphragms; coatings, and even heat exchangers (thin walled tubing), etc. Figure-1 shows a Teflon sleeve-line valve. Teflon sleeve separates the plug and body of this plug valve and acts as a lubricant thereby preventing sticking or freezing of the metal parts. It is inert to weak and strong acids, weak and strong alkalis, organic solvents, oxygen and ozone, and has high temperature resistance. Has poor resistance to ionizing radiation. Refer Table-1 for details.
- **Acryls/Methyl methacrylate (Lucite)**—Brush and purse handles; transparent displays; working models; airplane canopies; and taillights, etc. (refer Table-1)
- **Nylon**—Gears; drawer & shelf rollers; tennis-racket strings; dentures; automobile door catches; brush bristles; bushings for spinning buckets etc. (refer Table-1)
- **Chlorinated polyether (Penton)**—Widely used for handling corrosives, including aggressive environments. Used for Valve and pipe; linings and coatings, etc. Coatings can be applied by fluidized-bed process up to 40 mils thick. Figure-1 shows a valve with a Penton coated body. (Refer Table-1)
- **Polyethylenes**—Packing films; sheets; squeeze bottles; pans; tumblers; ice-trays; piping for water, etc. (Refer Table-1 for details)
- **Polystyrene (Styron)**—Wall tiles; battery cases; flow meters; radio cabinets; and refrigeration equipment, etc. (refer Table-1)
- **Rigid polyvinyle chloride (PVC)**—Pipes & fittings; ducts; fans; sheets; containers; and linings, etc. (refer Table-1)
- **Vinyls**—Pipes & tubing; packaging films; floor tiles; fibres; raincoats; garden hose; and insulation, etc. (Refer Table-1)

The environmental factors such as, acids, alkalis, organic solvents, water, oxygen, vacuum, ionizing radiation, temperature, etc., effecting thermoplastics are given in Table-1.

### 2-Thermoset Polymers:

Thermoset polymers assume a permanent form or set once heated. As a result, they can’t be reformed or recycled. Thermosets are amorphous polymers. These resins are liquid at room temperature. Then, by adding a catalyst or accelerator, they become a rigid product that sets or cures into its final form. The thermosetting resins are high-molecular-weight polymers that are strengthened with glass or different suitable materials to produce mechanical strength. The most commonly used resins are the vinyl esters, epoxies, polyesters and furans. For reinforcing these polymers, fibrous glass of F and C grades is most ordinarily used.

Unreinforced, unfilled thermosetting polymers will corrode by many mechanisms. This sort of corrosion may be divided into two main categories: physical and chemical. Physical corrosion is the interaction of a thermosetting compound with its setting so that its properties are altered without a chemical reaction. The diffusion of a liquid into the compound is an example. In several cases, physical corrosion is reversible; once the liquid is removed, the initial properties are restored. Once a compound absorbs a liquid or a gas leading to plasticization or swelling of the thermosetting network, physical corrosion has taken place.

Chemical corrosion takes place once the bonds within the thermosetting are broken by means of a chemical...
process with the polymer’s surroundings. It is sometimes irreversible. As a result of chemical corrosion, the compound itself is also affected. For instance, the compound is also embrittled, softened, charred, crazed, delaminated, discoloured, dissolved, blistered or swollen.

All thermosets are attacked in a similar manner. However, certain chemically resistant varieties suffer negligible attack or exhibit considerably lower rates of attack underneath a good range of severely corrosive conditions. Curing the resin plays a very important role in the chemical resistance of the thermosetting. Improper activity can lead to a loss of corrosion-resistant properties.

Some environments might weaken primary and/or secondary compound linkages with ensuing de-polymerization. Alternative environments might cause swelling or micro-cracking, whereas still others might change ester groupings or linkages. In some environments, re-polymerization will occur, causing a modification to the structure.

In general, chemical attack on thermosetting polymers could be a "go/no-go situation." With an improper setting, attack on the strengthened polyester can occur within a short time. Experts indicate that if an installation has operated with success for 12 months, it will still operate satisfactorily for a considerable amount of time. Thermosetting polymers aren't capable of handling targeted sulphuric acid (93%) and concentrated acid.

Stress corrosion is another issue to contemplate. The failure rate of glass-reinforced composites may be important. This can be especially true of composites exposed to a mix of acid and stress. Stress cracks develop once a troublesome polymer is stressed for an extended amount of time. Cracking can occur with very little elongation of the material. There is less probability of environmental stress cracking when the molecular weight of the polymer is high.

The common types of thermoset plastics/polymers and their uses are listed below:

- Epoxies (Epon/Durcon/Araldite) – Castings; extrusions; sheets; adhesives; protective coatings; pipes; valves; pumps; small tanks; linings; dies for forming metals, printed circuits; insulation; and containers, etc.(refer Table-1)
- Phenolics (Backelite/Durez) – Radio cabinets; telephones; electrical sockets and plugs; pumps; valves; trays; auto distributors; rollers; and coatings, etc.(refer Table-1)
- Polyesters (Dacron/Dypol/Vibrin) – Luggage; automobile body with fibre glass reinforcement, etc.(refer Table-1)
- Silicones (Dow Corning) – Moulding compounds; laminating resins; insulation for electrical motors and electronic equipment, etc.(refer Table-1)
- Urea’s (Lauxite/Beetle) – Kitchen dishware & utensils; electrical fixtures; radio cabinets; closures; and adhesives (e.g. bonding plywood). Refer Table-1.
- Laminates & Reinforced Plastics – Laminated with cloth, mats, paper, chopped fabrics. or fibres such as fibre glass, for increasing tensile strength. Uses include- tanks, pipe, ducts, sheets, rods, car bodies, boats, missiles, and satellite parts, etc. Refer Table-1)

The environmental factors such as, acids, alkalis, organic solvents, water, oxygen, vacuum, ionizing radiation, temperature, etc., effecting thermoset plastics are given in Table-1.

**CONCLUSION:**

Polymers are more resistant to chemicals than their metal counterparts and do not require post-treatment finishing efforts, unlike metal. They are up to ten times lighter than typical metals and handle far better than metals in chemically harsh environments and avoid costly repairs brought about by corroding metal components. They are thermally and electrically insulating in nature. Polymers cannot withstand very high temperature as all plastics melt down very soon as compared to metals. The strength to size ratio of polymer is less while for metals is more but cannot be machined easily. Heat capacity of polymer is very less so cannot be used in heat applications. The disposal can become an issue as some polymers cannot be recycled but all metals can be recycled.
Chemical Industry is Central to the modern economy.

The chemical industry in the USA comprises approximately 15% of the US manufacturing economic sector as of 2018.

The chemical industry of India is a major contributor to the Indian economy, contributing 7% of the country’s Gross Domestic Product (GDP). India’s chemical industry ranks as sixth largest in the world, and third in Asia. The value of the chemical industry in India was estimated at 100 billion dollars in 2019.

World Chemical Industries Development- a Historical perspective.

Although chemicals were made and used throughout history, the birth of the heavy chemical industry coincided with the beginnings of the Industrial Revolution. Heavy chemical industries by definition is the production of chemicals in large quantities for a variety of uses.

Chemical Industry is Central to the modern economy.

The chemical industry comprises of the companies that produce industrial chemicals, it converts raw materials (oil, natural gas, air, water, metals, and minerals) into more than 70,000 different products.

The plastics industry contains some overlap, as some chemical companies produce plastics as well as chemicals. Various professionals are involved in the chemical industry including chemical engineers, chemists and lab technicians.

We will trace below birth of various chemical industries.

Production of Sulphuric Acid

One of the first chemicals to be produced in large quantities through industrial process was sulfuric acid.

Joshua Ward, a pharmacist developed a process in 1736 for production of sulphuric acid that involved heating saltpetre (Potassium nitrate) and allowing the sulfur to oxidize and combine with water. It was the first practical production of sulfuric acid on a large scale which used leaden condensing chambers (Lead lined condensing chambers) for the manufacture of sulfuric acid. John Roebuck and Samuel Garbett were the first to establish a large-scale factory in Prestonpans, Scotland, in 1749, which used leaden condensing chambers for the manufacture of sulfuric acid.

Production of Bleaching Powder

In the early 18th century, cloth was bleached by treating it with stale urine or sour milk and exposing it to sunlight for long periods of time, which created a severe bottleneck in production. Sulfuric acid began to be used as a more efficient agent as well as lime by the middle of the century, but it was the discovery of bleaching powder by Charles Tennant that spurred the creation of the first great chemical industrial enterprise. His powder was made by reacting chlorine with dry slaked lime and proved to be a cheap and successful product. He opened a factory in St Rollox, north of Glasgow, and production went from just 52 tons in 1799 to almost 10,000 tons just five years later.

Charles Tennant’s St. Rollox Chemical Works in 1831, then the biggest chemical enterprise in the world.
Production of Soda ash

Soda ash was used in the production of glass, textile, soap, and paper, since ancient times. The source of the potash had traditionally been wood ashes in Western Europe. By the 18th century, this source has becoming uneconomical due to deforestation, and the French Academy of Sciences offered a prize of 2400 livres for a method to produce alkali from sea salt (sodium chloride). The Leblanc process was patented in 1791 by Nicolas Leblanc who then built a Leblanc plant at Saint-Denis. He was denied his prize money because of the French Revolution.

In Britain the Leblanc process became popular. William built the first soda works in Britain at the Losh, Wilson and Bell works on the River Tyne in 1816, but it remained on a small scale due to large tariffs on salt production until 1824. When these tariffs were repealed, the British soda industry was able to rapidly expand. James Muspratt’s chemical works in Liverpool and Charles Tennant’s complex near Glasgow became the largest chemical production centres anywhere. By the 1870s, the British soda output of 200,000 tons annually exceeded that of combined production of all other nations in the world.

These huge factories began to produce a greater diversity of chemicals as the Industrial Revolution matured. Originally, large quantities of alkaline waste were vented into the environment from the production of soda, provoking one of the first pieces of environmental legislation to be passed in 1863. This provided for close inspection of the factories and imposed heavy fines on those exceeding the limits on pollution. Methods were devised to make useful byproducts from the alkali.

The Solvay process for production of Soda ash

The Solvay process was developed in 1861 by the Belgian industrial chemist Ernest Solvay.

Ernest Solvay, patented an improved industrial method for the manufacture of soda ash.

Solvay and his brother Alfred constructed a plant in Charleroi, Belgium in 1864. They expanded into a larger plant in 1874 in Nancy, France. The new process proved more economical and less polluting than the Leblanc method, and its use spread.

Ludwig Mond visited Solvay in the same year to acquire the rights to use Solvay process and Mond formed Brunner, Mond & Co. along with John Brunner, and built a Solvay plant at Winnington, England. Mond was instrumental in making the Solvay process a commercial success. He made several refinements between 1873 and 1880 that removed byproducts that could inhibit the production of sodium carbonate in the process.

Manufacture of Coal Chemicals

Manufacture of chemical products from fossil fuels began at scale in the early 19th century. The coal tar and ammoniacal liquor residues of coal gas manufacture used for gas lighting began to be processed in 1822 at the Bonnington Chemical Works in Edinburgh to make naphtha, pitch oil (later called creosote), pitch, lampblack (carbon black) and Sal ammoniac (ammonium chloride). Ammonium sulphate fertilizer asphalt road surfacing, coke oil and coke were later added to the product line.

Production of chemical fertilizers

Production of artificial manufactured fertilizer for agriculture was pioneered by Sir John Lawes at his purpose-built Rothamsted Research facility. He established large works in the year 1840 near London for the manufacture of superphosphate of lime.

Vulcanization of rubber

Processes for the vulcanization of rubber were patented by Charles Goodyear in the United States and Thomas Hancock in England in the year 1840.

Synthetic Dye

The first synthetic dye was discovered by William Henry Perkin in London. He partly transformed aniline into a crude mixture which, when extracted with alcohol, produced a substance with an intense purple colour. He...
also developed the first synthetic perfumes.

German industry quickly began to dominate the field of synthetic dyes. The three major firms BASF, Bayer and Hoechst produced several hundred different dyes. By 1913 German industry produced almost 90% of the world supply of dyes and sold approximately 80% of their production abroad.

**Production of chemicals by brine electrolysis**

In the United States, Herbert Henry Dow's use of electrochemistry to produce chemicals from brine was a commercial success that helped to promote the country's chemical industry.

**Production of Petrochemicals/ plastics**

The petrochemical industry can be traced back to the oil works of James Young in Scotland and Abraham Pineo Gesner in Canada.

The first plastic was invented by Alexander Parkes, an English metallurgist. In 1856, he patented Parkesine, celluloid based on nitrocellulose treated with a variety of solvents. This material, exhibited at the 1862 London International Exhibition, anticipated many of the modern aesthetic and utility uses of plastics.

**Production of Soap**

The industrial production of soap from vegetable oils was started by William Lever and his brother James in 1885 in Lancashire based on a modern chemical process invented by William Hough Watson that used used glycerine and vegetable oils.

**Large scale production of Chemicals**

The late 19th century saw an explosion in both the quantity of production and the variety of chemicals that were manufactured. Large chemical industries arose in Germany and later in the United States.

By the 1920s, chemical firms consolidated into large conglomerates; IG Farben in Germany, Rhône-Poulenc in France and Imperial Chemical Industries in Britain. DuPont became a major chemicals firm in the early 20th century in America.

Polymers and plastics such as polyethylene, polypropylene, polyvinyl chloride, Polyethylene terephthalate, polystyrene and polycarbonate comprise about 80% of the industry's output worldwide. These materials are often converted to fluoropolymer tubing products and used by the industry to transport highly corrosive materials.

Chemicals are used in many different consumer goods, and are also used in many different sectors. This includes agriculture, manufacturing, construction and service industries.

Major industrial customers include rubber and plastic products, textiles, apparel, petroleum refining, pulp and paper, and primary metals.

Chemicals are nearly a $3 trillion global enterprise, and the EU and U.S. chemical companies are the world's largest producers.

**Chemical Business**

Chemical sales can be divided into a few broad categories, including basic chemicals (about 35% - 37% of dollar output), life sciences (30%), specialty chemicals (20% - 25%) and consumer products (about 10%).

Chemicals, such as organic and inorganic chemicals, bulk petrochemicals, other chemical intermediates, plastic resins, synthetic rubber, man-made fibres, dyes and pigments, printing inks, are basic chemicals. These are also known as commodity chemicals.

Specialty Chemicals

Specialty chemicals, in the strictest sense, are products sold on the basis of their performance or function rather than their composition. They can be single-chemical entities or formulations whose composition sharply influences the performance and processing of the customer's product.

Specialty chemicals are driven by extensive product R&D and innovation, which is a significant differentiator over the commoditized chemical industry. These chemicals are derived from basic chemicals and are sold on the basis of their functions. For example, paints, adhesives, electronic chemicals, water management chemicals, oilfield chemicals, flavours and fragrances, rubber additives, paper additives, industrial cleaners and fine chemicals, sealants, coatings, catalysts etc., come under this category. Biocides, corrosion inhibitors, cosmetic chemicals, food additives, industrial and institutional cleaners, lubricating oil additives, oil field chemicals, printing inks, surfactants, and synthetic lubricants.

Some of the categories of specialty chemicals are adhesives, agrichemicals, cleaning materials, colours, cosmetic additives, construction chemicals, elastomers, flavors, food additives, fragrances, industrial gases, lubricants, paints, polymers, surfactants, and textile auxiliaries.

In 2020, the world's five-largest specialty chemicals segments—specialty polymers, electronic chemicals, industrial and institutional cleaners, surfactants, and flavors and fragrances—had a market share of 38%. Each specialty chemicals business segment comprises several sub segments, each with individualized product, market, and competitive profiles.

Speciality chemicals include...
antioxidants, catalysts, construction, feed additives, printed circuit board and semiconductor packaging, plastics additives, paper chemicals, rubber-processing chemicals, specialty coatings, specialty polymers, textile chemicals, and water management chemicals, flavours and fragrances, rubber additives, paper additives, industrial cleaners and fine chemicals, sealants, coatings, catalysts etc. come under this category.

Biocides, corrosion inhibitors, cosmetic chemicals, food additives, industrial and institutional cleaners, lubricating oil additives, oil field chemicals, printing inks, surfactants, and synthetic lubricants are also specialty chemicals.

Western Europe is the leading consumer of neutraceuticals and flavors and fragrances. Mainland China is the largest consumer of the following specialty chemicals: antioxidants, catalysts, construction, feed additives, printed circuit board and semiconductor packaging, plastics additives, paper chemicals, rubber-processing chemicals, specialty coatings, specialty polymers, textile chemicals, and water management chemicals.

Asia has the highest consumption value for following chemicals
- Ammonia
- Bromine
- Calcium carbonate
- Chlorine
- Fluorine
- Hydrogen
- Hydrogen chloride
- Hydrogen fluoride
- Hydrogen peroxide
- Iodine
- Nitric acid
- Oxygen, nitrogen and the rare gases
- Phosphoric acid
- Phosphorus
- Sodium carbonate
- Sodium hydroxide
- Sulfur
- Sulfuric acid
- Titanium dioxide
- Benzene and methylbenzenes
- Buta-1,3-diene
- Epoxyethane (Ethylene oxide)
- Ethane-1,2-diol (Ethylene glycol)
- Ethanoic acid (Acetic acid)
- Ethanol
- Ethene (Ethylene)
- Methanal (Formaldehyde)
- Methanol
- Methyl tertiary-butyl ether
- Phenol
- Propane (Acetone)
- Propene (Propylene)
- Urea

History of Chemical production in India

Bengal Chemicals and Pharmaceutical was the first pharmaceutical company to be set up in India in 1901 by P.C. Roy who was professor of chemistry at Calcutta University at that time. After 9 years of setting up of Bengal chemicals and pharmaceutical company, one more pharmaceutical company called Alimelbi Chemical works was set up at Baroda (Now known as Vadodara) in Gujarat.

The Indian Chemical Manufacture association, now called Indian Chemical Association (ICA) was founded in 1938 in by P. C. Ray, Rajmitra, B. D. Amin and other Industries to promote the national chemical industry of India.

The Council of Scientific and Industrial Research (CSIR) was established in 1942 with the aim of providing scientific and industrial research to maximize the scientific, economic, and environmental benefits to the people of India.

Before World War II, foreign companies had the domain in the drug industry of India. After World War II, foreign company domain in drugs decreased and more Indian drug companies were established.

During this time, the Indian government established five drug companies. The two of them are Hindustan Antibiotics Limited and Indian Drugs and Pharmaceutical companies.

Hindustan Antibiotics Limited (HAL), based in Pune, India, is the first government-owned-drug manufacturing company under the ownership of Ministry of Chemicals and Fertilizers, Government of India.

Indian Drugs and Pharmaceuticals Limited (IDPL) was founded in 1961. It is a public sector pharmaceutical, bulk drug manufacturing and drug Discovery company owned by the...
Indian government.

After India got independence from the British Raj in 1947, India established many units of basic chemicals, dyes, textiles and fertilizers. In 1964, a downstream plant was established in Mumbai.

In the 1980s and 1990s, the petroleum industry of India had grown faster with the development of the gas cracker, along with related downstream industries for polymers, synthetic fibres, aromatic and other chemicals.

In early 1980, the IPCL had established a plant-based on a cracker in Gujarat and Maharashtra. However, the growth in the petroleum industry in India was suppressed due to inadequate supply of raw materials coupled with high import duties in the petroleum industry.

During that period private industry entry into the petroleum industry. Reliance industries have set up many plants in PatalGanga (Maharashtra), Jamnagar (Gujarat), Hazira (Gujarat). This led to an increased role of Reliance industries in the petroleum industry.

This also led to the entry of Reliance industries into the polyester business, such as purified terephthalic acid, and polyethylene terephthalate resin. These new materials are used to make polyester fibre, bottle and filamentation.

Indian Chemical Industry Segments

India's chemical industry ranks as sixth largest in world, and third in Asia. The Indian chemical industry produces 80,000 different chemical products. India was also the third largest producer of plastic in 2019. As of September 2019, the alkali chemical industry produced 71% of all chemicals produced in India.

The chemical industry of India is a major contributor to the Indian economy, contributing 7% of the country's Gross Domestic Product (GDP). India's chemical industry ranks as sixth largest in world, and third in Asia. The value of the chemical industry in India was estimated at 100 billion dollars in 2019. The chemical industry of India generates employment for five million people.

India's chemical industry accounts about 14% of production in Indian industries. The Indian chemical industry mainly produces basic types of chemicals as well as knowledge type chemicals and specialty type chemicals as of 2018.

Gujarat was the largest state contributor to the chemical industry of India. Petrochemicals, fertilizers, paints, varnishes, glass, perfumes, toiletries, pharmaceuticals, etc are also produced in India.

The India chemical industry is divided into six sub-segments. These sub-segments are Basic Organic Chemicals, Specialty Chemicals, Chlor-alkali, Pesticides, Dyestuff, and alcohol-based chemicals. India is a major producer of basic organic chemicals.

The six segments of the Chemical Industry in India.

- Basic Organic Chemicals,
- Speciality Chemicals,
- Chlor-alkali,
- Pesticides,
- Dyestuff and
- Alcohol based chemicals.

Basic Organic Chemical Industries

The organic chemicals industry is one of the most significant sectors of the chemical industry in the world. It plays a vital role in providing inputs for other industries of paints, adhesives, pharmaceuticals, dyestuffs and intermediates, leather chemicals, pesticides, etc. Methanol, acetic acid, formaldehyde, pyridine, phenol, alkylamines, ethyl acetate, and acetic anhydride are major basic organic chemicals that are produced in India.

Six major chemicals are produced in India: methanol, aniline, alkylamines, and its derivatives formaldehyde, acetic acid, and phenol contributing to nearly 2/3 of Indian basis organic chemical industry.

Chlor-Alkali Chemical Industry

The Chlor-Alkali is an industrial process for the electrolysis of sodium chloride solutions. There are different types of chemical solution. In India Chlor-alkali industry mainly consists of the production of three inorganic chemicals. The main three inorganic chemicals that are produced in this industry are caustic soda (NaOH), chlorine (Cl2) and soda ash (Na2CO3).

Hydrogen is also produced in this industry in small amounts.

The chlor-alkali industry inputs are mainly used in soaps and detergents, pulp and paper, textiles, aluminium processing industry for caustic Soda ash is used in in glass, silicate production etc apart from soaps and detergents. In the financial year 2019–2020 of Chlor-alkali industry of India produced over four million metric tons of alkali chemicals.
Caustic soda demand could exceed global capacity in the latter half of this decade, predicted based on the analysis of trends versus current and future capability.

The potential for shortfall will largely depend on the severity of the downturn in global economic activity predicted by the International Monetary Fund.

The main problems within the chlor-alkali sector in 2022 revolve around the high price of caustic soda in Europe due to the natural gas and electricity price hikes. "In Q2, due to high export prices out of Europe, very few deals have been concluded but this has begun to improve lately as European exporters have reduced prices to be competitive. The continuance of high freight costs and delays are among the obstacles to successful export strategies.

Source: Tecnon OrbiChem

### World Caustic Soda Capacity 2018 – 2030

[Graph showing world caustic soda capacity from 2018 to 2030 with data on different regions.]
The dotted yellow line in the graph above shows plants running at the 90% capacity we can expect, with the red line representing historical consumption and forecast to 2030. The graph demonstrates that if capacity remains at current levels with no new plants coming online, forecasted consumption will exceed capacity between 2024 and 2025.

**Ebbs & flows**

US caustic soda demand dropped around 5% in 2020. Most of the product’s downstream sectors were significantly affected by the pandemic except for the detergents, water treatment and bleach sectors. The packaging sector was boosted during the pandemic as consumers sought goods via online websites and those purchases required packaging solutions.

When the US economy began bouncing back in 2021, its 2.5% recovery rate was lower than expected, due to unforeseen circumstances including February’s Deep Freeze, which impacted demand – and predictions – for caustic soda. The sector’s recovery was slow and lingers still. Caustic soda supply remains short today, in part, because of 2021’s production cuts. Typically, a high proportion of West European imports come from the US but that decreased recently due to US production cuts, transportation costs and long lead times.

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**Global caustic soda consumption by end-use**

Source: Tecnon OrbiChem

**Pulp & Paper industry caustic soda consumption by region 2020 – 2022**

Source: Tecnon OrbiChem
Driving caustic soda demand: As the chart above shows, the chemical sector is major consumer caustic soda globally. Traditionally, alumina accounts for 21% of caustic soda consumption, however, it is one of the sectors that has struggled to recover from the pandemic and supply chain issues including the global semiconductor chip shortage. And just as the chip shortage has started to ease, a deteriorating economy is emerging. This will likely limit the automotive industry’s potential to bounce back in the foreseeable future.

North American and West European alumina sectors are relatively small in comparison to the commodity's global consumption rates. Despite this, the aluminium sector is still important, especially for US export demand. For example, the US exports quite a lot of caustic soda to Australia, which is used in the aluminium sector.

### Pulp & Paper

The pandemic triggered a paper boom as demand for tissue products soared, along with feedstock materials for facemasks and corrugated board for e-commerce packaging due to the explosion of online purchases by locked down consumers.

Calculating ECU: Because high electricity costs are having such a great impact on the cost of production of caustic soda, the costs based on three energy megawatt hour (MWh) scenarios between €55 and €275 per MWh are calculated as below. The green line in the graph above represents the cost of export prices out of Europe, which have been soaring since 2021. They are higher than 2018 levels, when the phasing out of Mercury-based chlor-alkali production reduced European capacity.

Looking forward, operating rates in Europe are likely to remain reduced due to weakening demand in some chlorine derivatives. The US is likely to see this too, but perhaps to a lesser degree due to capacity curtailment and ongoing production issues. However, with hurricane season imminent, operating rates may be affected.

These circumstances will probably keep caustic soda balanced over the next couple of months. Q3 or Q4 may see some softening in demand or lengthening of caustic soda supply.

Summary: Caustic soda lost around three years' growth due to the pandemic and capacity currently online is going to be sufficient until around 2025. Without added capacity though, we could see shortages along with the price hikes that necessarily follow. But which companies will be willing to invest in new plants or expansions at such a volatile time? The question remains to be answered with time.

Source: Tecnon OrbiChem
The $4.7 trillion global chemical industry is critical to modern living and a key enabler of several other industries. Though it directly contributes about 4% to global GDP and employs 15-mn globally, its indirect impacts are larger and far-reaching. By some estimates, a whopping 98% of all manufactured goods use some chemical input at some stage of their manufacturing.

What is also evident is that the modern chemical industry is built on a shaky foundation, with its now unacceptable dependence on fossil-derived carbon – be it coal, oil or natural gas. Most of the key building blocks of the industry – ammonia, methanol, ethylene, propylene, butadiene, benzene, toluene and xylene, in the main – are derived from fossil resources, and unless their manufacture transitions to a more sustainable mode, other parts of the industry, or for that matter the global economy, will find their transition very challenging.

A recent report, Planet Positive Chemicals, from Systemiq, a system change company, and the Center for Global Commons at the University of Tokyo, warns that without urgent action, the chemical industry faces reputational and regulatory risks, and may lose its social license to operate.

Lagging behind
According to the report, the chemical industry is currently lagging in its commitment to science-based targets to transition to net zero emissions and is expected to be the last system to achieve the key tipping points needed to mainstream emission reduction technologies."

How big of a problem the industry has is evident from some numbers regarding its carbon footprint. The production of the eight basic chemicals mentioned earlier have associated carbon emissions (Scope 1, 2 and 3) of 2.3-GtCO₂eq (gigatonnes, carbon dioxide equivalent), representing about 4% of the 59-GtCO₂eq global annual emissions and 72% of all emissions from the chemical industry.

Within this 2.3-GtCO₂eq, Scope 3 emissions account for 64% (1.5-GtCO₂eq), which is not surprising considering the industry’s reliance on fossil resources both as energy source and as chemical feedstock. This upstream component of the Scope 3 emissions is estimated at about 0.5-GtCO₂eq, but is surpassed by high associated downstream Scope 3 emissions (1.0-GtCO₂eq) that stem from the carbon-rich content of the products it makes, such as plastics and urea, to cite two examples.

Given the dominance of the Scope 3 emissions in the total carbon footprint of the chemical industry, it stands to reason that tackling this is key to transitioning the industry to net zero. The consequences of not doing so have been assessed in the report, and the findings are frightening. If this one industry continues to scale up without reducing emissions, it would be responsible for 24-38% of the total 2020-2050 global carbon emissions budget for a 1.5°C future. A ‘business as usual’ (BAU) scenario would align with a 4°C global warming scenario by 2050, which is simply not acceptable.

Pushing planetary boundaries
Besides the carbon and consequent climate impacts, the report is critical of other impacts the chemical industry has, the tolerable levels of which it terms as “planetary boundaries." It is argued that these are now being breached by the industry, and represent a multi-pronged threat to the planet and to society. As examples of breaches, the report talks of pollution by the processes and products of the industry, highlighting, in particular, the impacts posed by the massive leakage of plastics into the environment at end-of-life. Nitrogen leakage – in the form of fertiliser run-off from farms – into the biosphere is also a worrisome impact. At the same time, the report also warns of the dangers from poorly thought out net zero strategies, such as the land use change and impacts on biodiversity that may come about due the reckless use of biomass as feedstock, instead of petroleum based resources.

Demand reduction through circular approaches
One of the approaches that the report strongly advocates dwells on the demand side and involves circular economy approaches spanning reduction, reuse, substitution and recycling. Ambitious demand side reduction, in the range of 23-31% (372-mt to 526-mt) is feasible, and will come with several benefits. It will reduce reliance on new technologies that are still scaling up, such as use of bio-based or waste-derived feedstocks, and carbon capture utilisation and storage (CCUS); reduce the absolute amount of chemical production and hence investment.
needed commensurately, compared to a BAU scenario; and cut waste and pollution so as to directly reduce the planetary boundary impacts.

But achieving this will not be easy. Much of the chemical industry still operates in a linear mode – with low levels of reuse and recycling, and significant waste generation. For example, up to 70% of the nitrogen input in fertilisers is not taken up by plants, and under 10% of all plastic created so far has ever been recycled.

The systemic change will need “coordinated and ambitious action from the chemical system and the downstream value chains using chemicals in materials, fertilisers and products.”

**Decoupling from fossil fuels**

Almost the entire carbon feedstock used by the industry (713-mt) presently comes from virgin fossil resources, and this needs to change significantly if the upstream Scope 3 emissions are to be slashed. Alternate carbon sources include: biogenic ones; direct air capture (DAC) as well as point sources of CO₂; and solid wastes. The report estimates, that by 2050, as much as 82% of the carbon feedstock can come from these alternative sources, leaving only 77-mt of virgin fossil carbon in the system – an 89% reduction from today.

In addition, up to 234-mt of green hydrogen – produced by electrolysis of water using clean energy – may be required, predominantly (99%) for production of ammonia and methanol. The green methanol so produced can be the feedstock for a host of other chemicals through the deployment of technologies such as methanol-to-olefins (MTO). It can thus displace fossil feedstocks conventionally used for the purpose, and serve as a way to recycle waste carbon within the chemical system. Its demand is expected to rise from 102-mt in 2020 to ~440-mt in 2050.

The transition of the chemical industry to a sustainable growth path will also require it to use far more renewable energy than now. Electric steam crackers – now under development by several companies of which a partnership of BASF and SABIC is one – represent a big step in this direction as it will render olefins and aromatics with far lower carbon footprints even if the raw material base is fossil based. Wider deployment of CCS will also be needed to tackle the unavoidable CO₂ emissions.

**Sizeable capital needed**

The report estimates that achieving net zero Scope 1-3 emissions will require ~$100-bn per year in capex deployment in the industry between 2020 and 2050 – 2.7x larger than the capital requirements in the BAU scenario. This will not be possible without strong governmental policy support, as well as shifting perceptions of value, business models, technology risk, and rates of return across the chemical value chain.

Despite this seemingly large capital requirement and the complexities associated with the transition, it seems that the markets can live with it. The study estimates the impact of the increased manufacturing costs on user products to be limited to the low single-digit percentage – 0.7-3.2% for soft drinks; 1.0-1.1% for cars; and 0.6-0.9% for food items.

**Implications for the chemical industry & role for policy makers**

Delivering on the transition will require the chemical industry to drive major shifts in technologies and locations of production. Greenfield investments will gravitate to centres with abundant and cheap renewable energy, and renewable carbon sources, and this could open up new geographies not conventionally associated with the industry. India, short on fossil fuels, is well placed to be one of them!

The business model of the industry will also change from the volume-based mode of today and instead seek revenue from more efficient value-adding service-focused applications of chemicals. Coalitions of converters, brands, retailers, shipping companies, etc. will be needed to guarantee a market for low-emission chemicals though offtake agreements.

Policy makers will need to put in place frameworks to help cushion economic shocks, incentivise preferred actions, and disincentivise harmful ones. The latter could be in the form of a carbon tax or incentives to put the business cases for low-emissions technologies on par or better than for traditional technologies.

The long lifetime of chemical facilities means investment decisions in the next few years will determine the trajectory of the industry during the critical decades to 2050. There is no time to lose. The good news is that a few companies are already showing the way. The challenge is to mainstream and accelerate the pace of the transition.

(Reproduced with permission from Chemical Weekly, 20th Sept 2022)
As demand for several chemical and allied products are steadily increasing and import levels rising, there are plenty of opportunities to set up new chemical projects and expand existing ones in India. Project promoters are clearly seeing several investment opportunities, not only in large-scale chemical projects, but also in medium- and small-scale ones.

In the case of several such projects, market demand and investment levels are not constraints, and globally competitive capacities can be built even in the small- and medium-scales. Furthermore, there are several project promoters who are willing to venture and seize such opportunities.

But the ground reality is that most of such willing and enthusiastic project promoters are unable to move on due to the difficulties and constraints faced in sourcing technical knowhow for setting up the projects in commercial scale. Several potential projects are now stuck due to this technology acquisition issue.

Publicly-funded research
Government of India has done its job by setting up and supporting 38 CSIR laboratories with more than 4,500 scientists at various levels working in such laboratories. Unfortunately, in spite of the CSIR labs existing for several decades now and the government of India spending thousands of crores of rupees year after year in maintaining these labs, they have not been able to meet the technology demand in the country at competitive level in commercial scale operations. The fact is that these laboratories are unable to create enough confidence amongst project promoters about their capability to develop and transfer technology for setting up projects in commercial scale.

Of course, there are a few bright spots. These include development of technology for hydrazine hydrate by CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad in collaboration with Gujarat State Fertiliser Company (GSFC); and claims on development of technology at pilot plant scale for lithium ion cells by CSIR-Central Electrochemical Research Institute (CSIR-CECRI), Karaikudi. But, these are too few!

Contribution of private sector
While this is the case with regard to CSIR labs, the contribution of private sector in developing technologies for setting up projects at competitive standards are also not at adequate level.

There are a number of technical consultants operating in the field of chemical projects who too have not adequately developed competence and expertise to develop technologies at requisite standards so as to create confidence amongst project promoters. Many focus on design and detailed engineering activities, rather than on development of basic technologies. Of course, there are a few technical consultants who strive to develop technologies, but they lack adequate resources and facilities, and are unable to make any impact on the overall technology scenario in the country.

Technology procurement from overseas
In the case of large-scale projects, like urea or petroleum refinery, Indian project promoters typically acquire
technology from abroad, paying huge technology fees. Furthermore, such technologies are being repeatedly acquired. For example, while there are number of urea projects in India operating for several decades, new urea projects are being set up only utilising technologies from overseas organisations.

Another aspect that cannot be ignored is that most project promoters – even those running successful projects for several years – just focus on buying technologies from anywhere, instead of working with research labs to develop the same. Many seem to think technology development efforts in the country to be a long-drawn affair and a risk, which obviously means they lack confidence or sustained interest in technology development.

**Gaps in speciality chemicals**

Of course, there are some projects like ethanol, sulphuric acid, single super phosphate, and a few others, where domestic technologies are available. However, this is certainly not so in the case of several products in the medium and small-scale level and in speciality chemicals. In the case of such small- or medium-scale projects, sourcing technology from abroad is not an option in view of the high fees demanded by overseas technology suppliers. In such circumstances, several potentially valuable project opportunities remain unexploited and the country remains a net importer of several such chemicals.

This is a serious issue facing the Indian chemical industry today and there do not seem to be any immediate solution.

**Way ahead?**

Project promoters should give up the attitude of seeking to buy technologies from abroad and instead focus on developing technologies by associating with established organisations such as CSIR labs. Will partnerships and joint ventures between CSIR labs and private organisations in India and abroad improve the performance of the former?

For now, it appears that the technology development climate in India in the chemical industry is not at the level that it could facilitate a big leap forward. It is high time industrial bodies, government agencies and research institutes put their heads together and ensure investment opportunities are not lost due to want of competitive domestic technology.

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Belgium Inovyn Bigan Project
Major chlorine gas leak incident at London Aquatics Centre, Stratford, London

Hari Saran Das, Honorary SHE Advisor, AMAI

INCIDENT
The London Aquatics Centre, at the Queen Elizabeth Olympic Park, Stratford, London was one of the main venues for the London Olympic Games in 2012, and was used for swimming, diving and synchronised swimming. It opened to the public in 2014. There are thousands of homes in and around the former Olympics site, including several high-rise buildings.

On 23rd March 2022, Wednesday, a large quantity of Chlorine gas released accidentally from the London Aquatic Centre. A major incident was declared following a gas leak at the London Aquatics Centre.

About 200 people were affected after inhaling released chlorine gas. Local residents residing near the Aquatic centre were very much scared of the above chlorine release incident.

INCIDENT CONTROL
About 200 people were evacuated from the Aquatic Centre after chlorine gas leakage. Almost 50 chlorine gas affected persons were treated by paramedics for breathing difficulties. People could be seen being placed in ambulances while others wore blankets.

Twenty-nine people were taken to hospital with breathing problems. 12 adults and seven children with respiratory problems were admitted in the Homerton Hospital in east London while nearby Newham Hospital and The Royal London Hospital also admitted gas affected persons for treatment.

Emergency alarm was raised and surrounding roads were cordoned off and members of the public were denied access to the park. Local people/residents of the area were advised to keep their doors and windows closed for the "next few hours".

The London Fire Brigade installed positive pressure ventilation fans to disperse chlorine gas into the atmosphere. Scientific adviser and hazardous materials adviser were deployed at the incident site for their expert advice.

London Ambulance Service said it was attending a major incident in Stratford and were awaiting guidance from the facilities management company, London Legacy Development Corporation (LLDC) and the emergency services on when the centre will be able to reopen.

Mayor of London Sadiq Khan said that incident area cordoned off and evacuated and was in close contact with emergency services who were dealing with a gas-related incident at the London Aquatics Centre.

Scene at the Incident Site
The aquatic centre looked and felt like a major incident site. Emergency service resources were huge and there was a cordon in place. There are lots of fire engines and ambulance personnel and it looked like they had created a makeshift centre to treat those with medical problems.

Root Cause of the Incident
The London Fire Brigade informed that the gas leak had been caused by a chemical reaction, causing a high quantity of chlorine gas to be released.
The centre is operated by Greenwich Leisure Limited (GLL), which confirmed that the release of chlorine gas occurred when the facilities management company that operates the plant room took delivery of pool chemicals.

From the above statements, we have inferred the following may be the probable reason of chlorine release from the facility.

Sodium hypochlorite is used for disinfecting swimming pool water and stored in large quantity at the plant site and is being replenished from time to time by the supplier. Acid is also stored at the site required for water treatment. However if sodium hypochlorite solution comes in contact with acid, it will react violently and evolve chlorine and the Chlorine release from such reaction cannot be stopped till all the chlorine is liberated/released. This has happened in the present case.

**Recommendation**

a. Pool chemicals should be properly labelled.

b. Incompatible materials should not be stored together.

c. The storage containers should be properly colour coded in addition to labelling.

d. Trained persons should handle pool chemicals.
**Around 76 startups to get financial support for work on water management**

*The Economic Times | 09 September 2022*

Seventy-six start-ups have been onboarded under the 'India Water Pitch-Pilot-Scale Start-Up Challenge' and they will be provided financial support of up to Rs 20 lakh each to work in the fields of water supply, used water management and water body rejuvenation. The shortlisted start-ups will be provided financial support of up to Rs 20 lakh each to work in the fields of water supply, used water management, water body rejuvenation and ground water management etc.


**Nachiyarpettai residents allege irregularities in Union Govt's water and housing schemes**

*The New Indian Express | 03 September 2022*

Over 780 families live in Adichanur panchayat located in T Palur block. Since March 2021, the authorities have been installing drinking water taps under Jal Jeevan Mission. But, residents claimed that authorities have not fully implemented the scheme in their panchayat and water does not flow through all taps.

They also alleged that panchayat president Ganesan had not provided houses to all those who had applied under the housing scheme. A total of eight petitions have been submitted at the Collectorate in this regard, but no action has been taken, the residents alleged.


**Andaman & Nicobar Islands become the 1st “Swachh Sujal Pradesh”**

*Jal Jeevan Samvad | 03 September 2022*

On 17th September, 2022 Andaman & Nicobar (A&N) Islands became the 1st “Swachh Sujal Pradesh”, which means that all the villages of the Islands have been certified as 'Har Ghar Jal' as well as verified as Open Defecation Free (ODF) plus. At the time of launch of Jal Jeevan Mission (JJM) on 15th August 2019, 46% of the rural households of Andaman & Nicobar Islands had access to potable drinking water through tap connections. Located in the southern reaches of Bay of Bengal, the UT has a total of 836 Islands and the task of providing potable water here was exigent yet formidable for the JJM.

Lightning Strikes – YIKES!!

Static sparks can occur whenever there is friction between materials during material movement, such as transfer.

Grounding and bonding can help dissipate an electric charge. To work, they need to be in good condition, be in good contact with the metal container, and be connected to a proper ground.

Lightning is a massive spark that is created when water droplets, dust, or ice particles move around a cloud, generating static electricity.

Lightning can strike anywhere - it is just not safe to work outdoors in an electrical storm.

An electrical current can travel through connected equipment and cause an incident far away from where the lightning actually struck.

Take precautions against static sparks – especially lightning.

In the early morning hours of May 16, 2012, a thunderstorm rolled into a Bristol, Pennsylvania plant that produced acrylic polymers. Lightning struck in the tank farm area. Within seconds, an ethyl acrylate tank exploded and was followed a few minutes later by a butyl acrylate tank explosion. The explosions and ensuing fires destroyed the two tanks and led to a lengthy shutdown. Two people were in the area of the tank farm doing paperwork during the lightning strike; fortunately, there were no injuries.

The tanks were grounded according to industry lightning standards, so why did the explosion occur? While it could not be determined with certainty, the ignition of the atmosphere in the ethyl acrylate tank most likely occurred because an internal component was not bonded to the tank. A spark may have occurred across a small gap and ignited the flammable vapor, similar to the way a spark plug ignites fuel in a combustion engine.

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NEWS DIGEST

General

Govt to decriminalise some offences under GST, lower compounding charges

*Business Standard | 28 September 2022*

The government is working on decriminalisation of certain offences under GST by raising the threshold limit for launching prosecution and also lowering charges for compounding of offence.

Currently, the law provides for launching prosecution against offenders in cases where the amount of Goods and Services Tax (GST) evasion or misuse of input tax credit is more than Rs 5 crore.

"We are working on making the provision under GST Act for prosecution more simpler and friendly for taxpayers. We have Section 132 under CGST Act which criminalises illegal credit for GST evasion. The threshold level (for launching prosecution) are being reconsidered," finance ministry additional secretary (revenue) Vivek Aggarwal said at an Assocham event.

Launching of prosecution by taxmen means commencement of legal proceedings against the offender.

The compounding charges for offences under GST would also be lowered so that taxpayers are encouraged to compound their offences instead of going into litigation.

Under GST Act, the amount payable for compounding of offences shall be 50 per cent of the tax amount involved subject to a minimum Rs 10,000. Maximum amount for compounding is 150 per cent of the tax or Rs 30,000, whichever is higher.

"The compounding provision in GST are prohibitive. It requires 50 per cent to 150 per cent as compounding fees which is impossible to pay. That's why there is zero compounding for all cases under GST. That is being relooked at so that it becomes affordable and compounding becomes a first or better choice for taxpayer," Aggarwal said.

The revenue department official further said that the robust growth in tax collection both in direct and indirect tax collections has paved the way for bringing in more taxpayer friendly reform to ensure ease of doing business and decriminalisation of tax laws.

The changes proposed in the GST law with regard to changes in prosecution threshold and compounding is likely to be placed before the GST Council in its next meeting.


Foreign trade policy extended by 6 months to March ’23

*Financial Express | 27 September 2022*

The government will extend again the validity of the current foreign trade policy (FTP), which provides a road map for boosting external commerce in goods and services, by six months through March 31, 2023.

Amit Yadav, additional secretary with the commerce ministry, told reporters that the decision was taken after demands from various industry associations and state-backed export promotion councils due to the uncertain external environment. The export bodies also suggested that the new FTP coincide with the beginning of a financial year, so that its performance can be better gauged. Yadav was accompanied by director general of foreign trade Santosh Kumar Sarangi.

The validity of the current FTP for 2015-20 was already extended three times, by a total of two-and-a-half years, through September 30, 2022 in the wake of the Covid-19 pandemic, mainly to maintain policy stability and soften the blow to exporters. The ministry had planned to release the FTP on September 29; this was to come into force from October 1.

Given the fast-evolving geo-political situations in the wake of the Ukraine war, currency volatility and lack of adequate support for the services sector in the proposed FTP, the policy document shouldn't be released at this point of time, exporters' bodies said in a meeting convened by the commerce ministry on Monday.

As such, as FE had reported earlier, this policy was unlikely to roll out any big-bang programme involving substantial fiscal incentives for exporters, given that most of the key schemes had already been announced.

However, the new policy was to provide for support of at least ₹5,000 crore to develop select districts across the country as export hubs, official sources had told FE in early July.
This was to be the most important scheme in the new FTP as far as fiscal incentives were concerned.

The latest extension will lend predictability to the policy regime for exporters and enable them to continue to get incentives under a clutch of extant programmes without any hiccups.

A new FTP is expected to be hammered out by March 2023, keeping in view fresh external risks as well as opportunities.

https://www.financialexpress.com/economy/foreign-trade-policy-extended-by-6-months-to-march-23/2692002/

**Colombia doubles its exports to India**

*The Asian Age | 26 September 2022*

South American nation Colombia has doubled its exports to India from January to June this year which has reached a volume of US$ 1.54 billion compared to the corresponding period last year due to the increase in exports of oil, coal, gold, teakwood, plastics, machinery and coffee, Colombian ambassador to India Mariana Pacheco Montes has said.

Speaking at a recent event organised by the European Union National Institutes for Culture (EUNIC) in the capital, the Colombian envoy spoke about the growth of both the Indian economy in Asia and the Colombian economy in the South American continent and said both nations “enjoy greater dialogue” at both the commercial and political levels. “India has invested more than $1 billion in Colombia which makes Colombia the third-largest destination for Indian investment in the Latin American region after Brazil and Mexico,” she added.

“Colombia and India have signed many agreements to promote trade, tourism and cooperation in areas like health, science and technology. We have advanced on MoUs in Ayurveda, traditional medicine, software and electronics etc,” Ms. Montes said.

https://www.pressreader.com/india/the-asian-age/20220926/281698323617869

**Exports to United Arab Emirates get a boost from trade deal, says Commerce Ministry**

*Millennium Post | 25 September 2022*

Exports of gems, jewellery, sugar confectionery, cereals, electrical machinery and other products to the United Arab Emirates (UAE) have registered a healthy growth after the two countries implemented a trade deal in May. The Commerce Ministry said that Indian exports to the UAE, excluding petroleum products grew from $5.17 billion during June-August 2021 to $5.92 billion during June-August 2022, an increase of over 14 per cent. However, sectors which recorded negative growth during the period include ships, boats and floating structures, apparel, pharmaceutical products, aluminium and articles, organic chemicals, carpets and other textile floor coverings, and silk. The India-UAE Comprehensive Economic Partnership Agreement (CEPA) came into effect from May 1.

“Indian exports are likely to increase further in the coming months with increasing use of the CEPA by the exporters and with dedicated efforts from Department of Commerce, in association with Indian Mission in the UAE, through organization of a series of trade promotion events in the UAE during the current financial year”, the ministry said in a statement. It said that data for May has not been included for the purpose of the analysis as it is considered as a transitory period. Oil trade has not been considered as import increase in oil/petroleum products is largely on account of the rise in global prices and to a certain extent on an increase offtake in volumes. Further, it is pertinent to mention that bulk of the oil imports from the UAE are of crude petroleum, the demand for which is inelastic and the customs duty for which is very low, the ministry said.


**An interim Indo-Canada trade pact likely by year-end: Canadian High Commissioner**

*Business Line | 22 September 2022*

Canada is home to the world’s largest Indian diaspora per capita. It’s also a top global destination for Indian students. Despite strong cultural, business and academic ties, bilateral trade volumes are very low. In an interview to businessline, Canadian High Commissioner in India Cameron MacKay speaks on the status of the trade talks and other issues. Excerpts.

Q What is the status of bilateral trade negotiations between Canada and India?

The bilateral commercial relationships between the two countries stand at $100 billion, which includes $70 billion of Canadian portfolio investment into India. But for two G20 economies, the size of our economies, that’s far too small. That’s an underperforming economic relationship. Started about 12 years ago, the negotiations have made no progress till recently. But India’s recent deals with Australia have given us new confidence and interest on both sides. We relaunched negotiations and made more progress since March than we had in the previous 12 years. So there’s definitely a renewed vigour and vitality in negotiations.

Q Do you see a possibility of arriving at an interim agreement?

Ministers are talking every monthl.
They have committed that they will have a deal by the end of the calendar year for an early progress trade agreement (EPTA). This will be followed later by CEPA (Comprehensive Economic Partnership Agreement) which will take longer. Round four of the negotiations will be held next week in Delhi. The meat and potatoes of the negotiation. We’re not at the final steps yet, but that will come soon. We think that there’s some kind of interim agreement can be arrived at.

Q What are the major challenges coming in the way of negotiations?

I don’t agree with the argument that negotiations are not progressing well. In the past there was no progress, now it is happening. I think the biggest issue in the past was different philosophies about what a trade investment treaty should do. And the Canadian philosophy is extremely ambitious and extremely comprehensive. With every other G7 country, we have a deep ambitious comprehensive deal.

Q Which key sectors can the two countries focus on to start with?

I get that question a lot actually. The Canadian Government’s philosophy is that the government should not be picking champion companies or champion sectors. We think the government is not well-suited to deciding today what are the sectors of opportunity in 5-10 years. Our philosophy is —be comprehensive, cover all sectors. Let’s open up and liberalise as much as we can.


Govt aims 1-hour clearance for goods at all ports

Live Mint | 22 September 2022

The government is working on streamlining approvals to ensure that goods for exports and imports are cleared within an hour of their arrival at seaports and airports to help catapult India’s share in global trade to 10% by 2047.

The ‘customs ONE’ plan prepared by the commerce department is part of the India@2047 blueprint, a vision to make the country one of the world’s top three economies and achieve developed nation status by the 100th year of its independence.

Currently, goods take anywhere between 24 and 48 hours for air cargo clearances, and up to 72 hours for sea cargo, according to customs data.

The government is also planning to set up economic zones outside India as an extension of the Aatmanirbhar Bharat initiative, according to a presentation by the department of commerce reviewed by Mint.

As part of the plan, the government has decided to project 100 Indian brands as global champions, aiming to make India among the top three in global services trade by 2047 in tourism, IT services, business services, healthcare, and education.

According to the customs department, an internal case study of the Jawaharlal Nehru Customs House, Mumbai, showed the average release time of imports has been consistently coming down since 2017.

It has reduced from 181.34 hours in 2017 to 144.18 hours in 2018, 105.4 hours in 2019 to 91.65 hours in 2020. The fastest import documents were cleared in 14 minutes in 2019 and 6 minutes in 2020, the study showed.


India-UAE bilateral trade to meet $100 billion target well ahead of deadline,

says Indian envoy

Business Today | 22 September 2022

Bilateral trade between India and the United Arab Emirates will achieve the $100 billion target sooner than expected, India’s envoy to the Gulf state has said.

“The trade has already crossed $72 billion and if things continue this way, it will soon cross $90 billion,” the ambassador of India to the UAE Sunjay Sudhir said on Thursday.

The two countries had inked a Comprehensive Economic Partnership Agreement (CEPA) in February to increase non-oil bilateral trade by 2027 in February. The virtual ceremony was witnessed by Prime Minister Narendra Modi and the President of the UAE Sheikh Mohammed bin Zayed Al Nahyan in the company of senior ranking officials.

Bilateral trade between India and the UAE stood at $43.3 billion in FY2020-21. India exported goods worth $16.7 billion to the Gulf state, while imports aggregated at $26.7 billion during the fiscal.


Union Cabinet approves national logistics policy

The Hindu | 21 September 2022

The Union Cabinet approved the National Logistics Policy which aims to reduce the cost of logistics and bring efficiency by "streamlining processes, regulatory framework and skill development."

The policy sets various targets, which includes reducing the cost of logistics from the current 13 or 14% of the GDP and bringing them down to global benchmarks by 2030, improving the Logistics Performance
Index ranking and creating a data-driven decision support mechanism for an efficient logistics ecosystem, according to a press statement.

The implementation of the policy would be monitored by the Empowered Group of Secretaries (EGoS) created under the PM Gati Shakti National Master Plan.

The policy also focuses on the development of warehouses with optimal spatial planning, promotion of standards, digitisation and automation across the logistics value chain, and improved track and trace mechanisms.

Other measures include seamless coordination between different stakeholders and speedy issue resolution, streamlined EXIM processes, human resource development to create an employable pool of skilled manpower.

Important initiatives under the policy include the Unified Logistics Interface Platform (ULIP), the Ease of Logistics Services platform, a e-handbook on Warehousing, training courses on PM Gati Shakti and logistics on i-Got platform, which were launched last week when the PM unveiled the policy.


CEA sees 7% GDP growth for a decade

*Financial Express | 21 September 2022*

India looks well poised to sustain a growth rate of 7% through the decade, V Anantha Nageswaran, chief economic adviser said.

“Given that the world is experiencing after-effects of the pandemic and the ongoing conflict in Europe, India’s growth rate has come off the projection (of 8-8.5% in the Economic Survey) made in January to about 7% for current financial year,” Nageswaran said, adding that this rate will likely be sustained in the remainder of the decade.

The Reserve Bank of India (RBI) has projected the gross domestic product (GDP) in real terms to expand at a rate of 7.2% for the current financial year, but it may revise the forecast marginally downwards given that the June quarter growth came in at 13.5%, as against 16.2% projected.

India replacing United Kingdom as the fifth largest economy in absolute terms is creditable achievement and it is barely a surprise, the CEA said.

Speaking on the progress made by UPI, Nageswaran said that the retail payment system is actually mimicking some symptoms of Central Bank Digital Currency (CBDC). “So we are sort of leap-frogging the technology even as other countries are grappling with the design of CBDC, India’s fast retail payment system is colliding with the functionalities that CBDCs are expected to deliver,” he said.

UPI will soon enable cross-border remittances with Singapore soon by allowing interoperability between Singapore’s e-Next with UPI. The cost of cross border remittances has come down to 6% level which was over 10% earlier. To make cross-border remittances free, interoperability is a critical component and UPI is enabling that, he said.

https://www.financialexpress.com/economy/cea-sees-7-gdp-growth-for-a-decade/2680641/

Lanka keen to upgrade Indo-Lanka FTA

*Millennium Post | 17 September 2022*

Sri Lanka is keen to upgrade the Indo-Lanka Free Trade Agreement into a comprehensive economic and technological partnership, President Ranil Wickremesinghe said, asserting that the work which started in 2018 and 2019 has not found much progress. The Free Trade Agreement (FTA) between India and Sri Lanka was the first-ever bilateral trade agreement for both countries, signed in 1998 and enforced in 2000. The pact is aimed at further boosting the economic ties between the two countries by liberalising trade norms. “Sri Lanka and India gradually have to wean themselves out of the barriers to investment and the non-tariff barriers to trade especially in relation to Sri Lanka Indo economic relations, Wickremesinghe said while addressing a gathering of the Sri Lanka-India Society to mark the 75th anniversary of Indian Independence.

He said the future relations of India with its neighbours will be determined by trade integration. “Trade integration gives an economic base. The common economic base is a prerequisite for better national security and better political relations, he said. The first such step would be to revive and upgrade the FTA into a comprehensive economic and technological partnership. The FTA-related work which started in 2018 and 2019 has not found much progress, he said. Wickremesinghe said the second step was to look at all the projects which India and Sri Lanka had agreed to, but got delayed at the Sri Lankan end.

http://www.millenniumpost.in/business/lanka-keen-to-upgrade-indo-lanka-fta-493186

International trade can now be settled in rupee as Centre amends policy

*Times Now News | 17 September 2022*

After months of deliberations, the Centre has finally brought an amendment in its foreign trade policy to facilitate international trade in rupee.

The Directorate General of Foreign Trade (DGFT) under the Ministry of Commerce and Industry Friday notified the changes to the policy.

The amendment in this policy will
allow international trade invoicing, payment and settlement in the Indian rupee.

The Reserve Bank of India (RBI) allowed authorised banks in India to open special rupee Vostro accounts of correspondent banks of any partner trading country to facilitate trade in the Indian currency.

Under the arrangement, Indian importers will make payment in rupees into the special Vostro account of the partner country bank against the invoices for the supply of goods or services from the overseas seller or supplier, the trade policy said.

In July, the RBI unveiled a mechanism to settle international trade in rupees to counter impact of the depreciation of global currencies.

The move was seen as aiming to promote trade with Russia, as the country used a similar mechanism to settle payments with Iran, which has also faced sanctions by the West.


**Need to build resilient supply chains, boost connectivity: PM Modi at SCO**

*Business Standard | 16 September 2022*

Prime Minister Narendra Modi has called for the Shanghai Cooperation Organisation (SCO) nations to build resilient supply chains in the wake of the Covid pandemic, at the 22nd SCO Summit in Samarkand, Uzbekistan. He stressed that greater connectivity among nations in the central Asian region and other member nations such as India would be needed to achieve this.

"The pandemic and the crisis in Ukraine have caused many disruptions in global supply chains, leaving the world facing unprecedented energy and food crises. SCO should strive to develop reliable, resilient and diversified supply chains in our region. For this, better connectivity will be required," Modi said at the summit. He also urged SCO nations to give full transit rights to each other, in an apparent reference to Pakistan which has periodically denied India the right to fly through its airspace.


**Logistics policy to boost sectoral plans, push rail share**

*Pehal News Team | 16 September 2022*

India is drawing up a plan for alleviating logistics infrastructure for 15 sectors together with cement, steel and fertilisers that can element essentially the most environment friendly means of transporting these commodities.

The plan is in step with the National Logistics Policy to be launched by Prime Minister Narendra Modi.

The concept is to perform focused interventions to guarantee sooner outcomes, officers mentioned.

"There might be quite a lot of comfortable interventions enabled by the policy. Focus might be on monitoring outcomes of efforts and rising coordination between the ministries liable for enhancing logistics motion within the nation,” authorities official, conscious of the contours of the proposed policy, advised ET.

Arindam Guha, chief & associate, authorities and public providers, Deloitte India, mentioned a mixture of extra infrastructure investments by the National Infrastructure Pipeline and prioritisation of tasks by the Gati Shakti initiative would give thrust to the logistics effectivity.

The logistics policy will search to be sure that extra weight is thrown behind the prevailing PM Gati Shakti grasp plan, which is in early phases of being carried out. The plan additionally consists of elevating the share of railways in general freight motion to 40% from round 28% now to deliver down prices and enhance effectivity.

In the present logistics modal combine, roads have round 60% share in freight motion, whereas the remaining share belongs to the water route. Efficient economies’ modal combine is 25-30% roads, 50-55% railway and 20-25% water, the commerce and business ministry mentioned in a draft policy in 2020.

"As the Dedicated Freight Corridor comes up, along with the thrust given by the logistics policy, we expect the share of railways to increase to 40% from around 28-29% now," mentioned one other official.

A big emphasis might be on multi-modal logistic parks that might be centred on seamless motion of products and other people throughout modes of transport.

The nationwide and state grasp plans would assist determine optimum multimodal transport combine to decongest roads by selling railways, inland waterways and coastal delivery.

"The NLP is predicted to facilitate a change within the modal combine to focus extra on railways (goal share of over 50%) and waterways (over 20%)," the official mentioned.

The Department for Promotion of Industry and Internal Trade (DPIIT) has additionally begun discussions to assess the price of logistics within the nation.

The authorities has to date been counting on international research which peg the fee at round 13-14% of the GDP. The policy seeks to deliver down this price to 8%. Transportation
prices are aimed to be decreased to 4% by 2030 from 6% now and people associated to warehousing to 2.5% from 3.5% now, in accordance to officers.

https://www.pehalnews.in/logistics-policy-to-boost-sectoral-plans-push-rail-share/2425849/

**Gati Shakti has spotted 196 key projects’**

*Live Mint | 16 September 2022*

The Union government has identified 196 critical infrastructure gap projects for work under the PM Gati Shakti National Master Plan, a top government official said. The government launched the ambitious PM Gati Shakti last year to provide multimodal connectivity infrastructure.

Critical infrastructure gap projects are pre-existing projects that need improvement for capacity addition. According to the Department for Promotion of Industry and Internal Trade (DPIIT) secretary Anurag Jain, various ministries are doing infrastructure audits to identify critical last and first-mile infrastructure gaps.

“So far, 196 critical infrastructure gap projects pertaining to port connectivity and movement of coal, steel and food products have been identified, on which the Network Planning Group (NPG) is coordinating with the concerned ministries. For instance, the entire rail stretch between Punjab to Assam has a 95 km single rail stretch. If the single rail of 95 km is converted into double trains between Gorakhpur to Valmiki Nagar, capacity will rise up to 15 rakes per day,” Jain said.

According to DPIIT special secretary Amrit Lal Meena, about 14 states, including Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Kerala, Madhya Pradesh, and Maharashtra, have formed their state-level logistics policies, and 13 state logistics policies are in the draft stage.

Officials further said that various ministries, including telecom, railways, road transport, and food & public distribution, have started using the platform for infrastructure planning and decision making.

Jain said the resolution of issues for time-bound project implementation had gained momentum through the Project Monitoring Group (PMG) mechanism, and about 1,300 issues have been resolved in the last eight months.

“If 1,300 issues, 40% issues relate to land availability, 25-30% of issues are of environmental clearances, 15% are on the right of use and right of way,” Jain said.

Logistics costs in the country are as high as 14-15% of the GDP compared to developed nations such as Singapore and the US, which have managed to cap this cost at 7-8% of the GDP and leveraged it to boost exports. Jain said the NLP aims to bring down the cost to 8% of the GDP by 2030.

https://www.livemint.com/industry/infrastructure/gati-shakti-has-spotted-196-key-projects-11663260534909.html

**India to witness massive formalization of economy through tech: Nandan Nilekani**

*The Economic Times | 16 September 2022*

India’s economy will undergo massive formalization in the next 10 years due to the unlocking of frameworks such as the Open Network for Digital Commerce (ONDC) and Open Credit Enablement Network (OCEN) and the democratisation of skilling through the National Digital Education Architecture (NDEAR), said Infosys chairman Nandan Nilekani.

“What you are seeing in India now is a domino effect and all these things coming together ... This will lead to massive formalization,” Nilekani said at an event hosted by workforce management startup Betterplace. The OCEN protocol enables customer- and MSME-facing apps to effectively ‘plug-in’ lending capabilities into their current products and services.

ONDC democratizes e-commerce by pitching unorganized retailers and corner stores online to create a level-playing field that would help them take on giants like Walmart-owned Flipkart and Amazon. NDEAR will act as a ‘super connect’ between various academic activities such as e-learning models and school records. These backbone networks are all aimed at formalizing the economy. It will lead to job creation and economic growth as well as increased tax collection, he said. There has already been a 20-30% increase in Income-Tax collections this year against India’s 7% GDP growth, as artificial intelligence and integration of financial transactions are plugging evasions, he added. Nilekani urged companies to look at the India Stack programmes to scale up their businesses and create jobs.


**China beats US to re-emerge as India’s top trading partner**

*Live Mint | 16 September 2022*

China overtook the US to return as India’s largest trade partner with $11.49 billion worth of goods traded in July, data released by the commerce ministry showed, underscoring the country’s growing reliance on its northern neighbour.

In comparison, trade with the US stood at $11.08 billion in July, amid a demand slowdown and recession fears in the US.

The growth in trade with China is largely on account of a surge in
imports and near-flat growth in exports to the US during the month. 
Exports to the US in July grew by 0.41% to $6.78 billion, while imports 
from China expanded by 45% to $10.2 billion.

The department of commerce had earlier contested China’s official data 
that showed Beijing was India’s largest trading partner in 2021-22. Delhi 
counteracted it, saying the US was India’s largest trading partner that year.

The US, however, remained India’s largest trading partner in the four 
months ended 31 July, with shipments worth $46.2 billion, more than 
China’s $40.4 billion.

Biswajit Dhar, a professor at Jawaharlal Nehru University, said import 
dependence on China is consistently rising as the Indian economy regains 
its growth momentum. “Over the past couple of years, the government has 
taken several measures to beef up domestic manufacturing capacities, 
including through the PLI scheme, so that import dependence on China can 
be reduced. But these measures have not been effective,” he added.

A commerce department official said while the decline in exports to 
Beijing is largely due to a change in the direction of India’s exports 
away from China, the growth in imports from China has largely been 
driven by imports of capital goods and intermediate goods. Imports of 
consumer goods and raw materials constitute a smaller fraction of total 
imports from China, he said. He added that major items like chemicals 
used in industrial products imported from China are used in meeting 
growing demands for industrial inputs. 
Imports like active pharmaceutical 
ingredients and drug formulations 
provide the Indian pharma industry 
with raw material for producing 
finished goods, which are then 
exported, he said.

Reflecting a sharp US demand 
slowdown, India’s exports also saw 
an 8% sequential fall in July to $6.7 
 billion, from $7.3 billion worth of 
shipments in June. On the other hand, 
in April-July, imports from the US have 
grown by 35%.

https://www.livemint.com/ 
economy/china-beats-us-to-re- 
emerge-as-india-s-top-trading-part- 
ner-11663267543382.html

India's non-petroleum exports to UAE 
underperform after FTA, 
shows data
Business Standard | 15 September 2022
India’s non-petroleum exports to the 
United Arab Emirates (UAE) grew 
only 4.5 per cent during the May- 
July period — the first three months 
since the trade pact with the West 
Asian nation kicked in — even as total 
outbound shipments to the country 
increased about 16 per cent to $8.09 
billion, commerce and industry 
ministry data showed.

In comparison, India’s overall non- 
petroleum exports grew 8 per cent 
during May-July while overall exports 
grew 15.1 per cent during the same 
period.

On the other hand, India’s trade 
deficit with the UAE witnessed an 
over threefold jump as compared to 
May-July 2021 to widen to $6.23 
billion, led by a jump in oil imports 
as global crude oil prices remain 
elevated due to the Russia-Ukraine 
conflict.

com/article/economy-policy/ 
post-fta-india-s-non-petroleum- 
exports-to-uae-underperforms- 
govt-data-122091500983_1. 
html#:~:text=India's%20 
non%2Dpetroleum%20exports%20 
to%20the%20United%20Arab%20 
Emirates%20(UAE,%248.09%20 
billion%2C%20exports%20%20 
and%20industry

With SBI as facilitator, 
rupee trade with Russia to 
be operational soon: FIEO
Business Line | 15 September 2022
India’s rupee trade mechanism with 
Russia may soon be in place with SBI agreeing to be the facilitating bank 
although the Russian government is 
yet to decide on the correspondent 
Russian bank, exporters’ body FIEO has said.

“Russia may decide on the correspondent Russian bank to 
partner with SBI for rupee trade in the next 15 days. Once rupee trade 
starts, we will not have to worry about currency devaluation,” said A 
Sakthivel, President, FIEO.

Demand for Indian goods Exports to 
Russia could increase by $5 billion 
per annum once the rupee payment 
mechanism is put in place as there is 
a lot of demand for Indian goods from 
the country, per estimates made by 
FIEO.

“While the Russia-Ukraine war is a 
settback to exports in the short run, 
we are looking to increase our exports to 
Russia once the rupee payment 
mechanism gets operationalised,” 
Sakthivel said.

Operationalisation of the rupee trade 
mechanism, rolled out by the RBI in 
July this year to enable invoicing of 
exports and imports in Indian rupee 
will result in seamless payments 
though the transportation issue need 
to be sorted out. In April-June 2022, 
India’s imports from Russia increased 
369.29 per cent to $9.26 billion while 
exports declined 37.82 per cent to 
$435.62 million.

https://www.thehindubusinessline. 
com/economy/indias-rupee-trade- 
with-russia-soon-to-get-operational- 
with-sbi-acting-as-facilitating-bank- 
fieo/article65890878.ece

Expect $470-billion 
merchandise exports by 
year-end, says FIEO
Business Standard | 14 September 2022
With global trade facing headwinds due to the ongoing conflict between Russia and Ukraine, merchandise exports from India are expected to grow at a slower pace during the current fiscal.

It may rise about 11 per cent to over $470 billion, apex body for exporters Federation of Indian Export Organisations (FIEO) said.

Exports grew 45 per cent year-on-year (YoY) to $422 billion in 2021-22.

Rising inflation and pile up of inventories in all major economies have affected the purchasing power, thus hitting demand.

Official data showed that outbound shipments from India hit a 13-month low at $33.92 billion, up 1.62 per cent, in August.

Trade deficit fell from a record high of $30 billion in July to $27.98 billion but remained elevated. Export of commodities such as engineering goods, gems and jewellery, and textiles witnessed contraction during August.

in%202021%2D22.

“Nearly every indicator of the UN Sustainable Development Goals is off track:” Gates Foundation report

Business Line | 13 September 2022

Nearly every indicator of the UN Sustainable Development Goals is off track at the halfway point for achieving them by 2030, said the Bill & Melinda Gates Foundation, in its sixth annual Goalkeepers Report.

However, it was optimistic that despite significant setbacks caused by overlapping global crises, there are opportunities to accelerate progress towards ending poverty, fighting inequality, and reducing the impact of climate change.

Co-authored by the Foundation’s Co-chairs Melinda French Gates and Bill Gates, “The Future of Progress” report discusses the impact of the pandemic, wars in Ukraine and Yemen, ongoing climate and food crises, and macro-economic headwinds on global ambitions, to improve and save millions of lives by 2030.


Andhra Pradesh tops India in attracting investment, gets Rs 40,361 cr till July

Deccan Chronicle | 13 September 2022

Andhra Pradesh has become India’s top industrial investment destination. It attracted investments worth Rs 40,361 crore in the first seven months this year -- against the Rs 1,71,285 crore actual investment the country received during this period.

According to a report from the central Department for Promotion of Industries and Internal Trade, issued for July, 2022, AP bagged the largest share of investments, followed by Odisha with Rs 36,828 crore. Both AP and Odisha accounted for 45 per cent of the entire investment inflow to the country this year.

Last week, the AP cabinet cleared proposals for investment worth Rs 1,26,748 crore. These projects, once ready, would generate direct employment to over 40,330 people in the next seven years, the government claimed.

The industries proposed for AP from January to July are as follows: five deals with electrical equipment, 19 for chemicals (except fertilizers), 1 metallurgical unit, 13 commercial and household equipment units, 2 fuels-related units, 18 for fertilizers-18, 27 food processing units, seven transportation units, 23 textiles firms, 24 paper and pulp units, 35 cement and gypsum units, 12 mechanical and engineering units, 38 miscellaneous industry units and 26 fermentation units.


Rs 11,000-crore investments lined up to create industrial hubs in UP

Business Standard | 12 September 2022

Tier-II and -III towns in Uttar Pradesh have garnered investments of more than Rs 11,000 crore in the past two years for a gamut of projects, signaling the emergence of new industrial hubs.

While the state government has been upgrading infra in smaller centres as well as mofussil towns, the private sector is exploring investment opportunities beyond the established industrial hubs owing to cheaper land rates and additional sops.

According to officials, while investment to the tune of Rs 7,000 crore has been made in different industrial projects in smaller towns, the UP State Industrial Development Authority (UPSIDA) enclaves have witnessed investment of about Rs 4,000 crore in the past six months.

Now, big projects are coming up in smaller places like Mathura, Chitrakoot, Prayagraj, Sambhal and Sandila vis-à-vis mega industrial backyards of Noida, and Greater Noida, etc.

UPSIDA has a large inventory of developed industrial corridors in Bareilly, Hathras, Agra, Mathura, Farrukhabad, Auraiya, Kannauj,
Unnao, Hardoi, Sandila, Chitrakoot, Prayagraj, Rae Bareli, Amethi, and Pilibhit.

“Prominent domestic and foreign investors have evinced interest in setting up plants in the smaller towns of UP,” UPSIDA Chief Executive Mayur Maheshwari said.

Meanwhile, UPSIDA has created an industrial land pool of more than 12,000 acres to facilitate faster allotment to private companies. The land of defunct industrial units are also being redeveloped for fresh allotment to investors.

Among the leading beneficiaries, Pilibhit, Amethi, Mathura, Varanasi and Chitrakoot have netted private investment of Rs 1,100 crore, Rs 700 crore, Rs 571 crore, Rs 500 crore, and Rs 475 crore, respectively, in recent months.

The Yogi Adityanath government has set a target of making the state a trillion-dollar economy by 2027 through speedier industrial development and boosting exports.


Challenges persist as govt. tries hard to bridge India's trade deficit

The Economic Times | 12 September 2022

Flat or decreasing exports, increasing imports due to pent up demand in the domestic market, depreciating rupee, hike in commodity prices including oil, geopolitical situations, restrictions on exports are the major reasons cited by experts for India's increasing trade deficit. Simply put, trade deficit is a situation in which the value of goods a country imports is greater than the value of goods it exports -- excluding software, remittances and others.

"Exports are slowing down while imports are increasing. This has led to widening trade deficit. The trade deficit was $190 billion last year and around $125 billion for the period from April-August 2022," Madan Sabnavis, Chief Economist, Bank of Baroda, told IANS.

"Exports are slowing down due to the global economy moving to recession. Imports are rising as demand is going up as our economy grows - both oil and non-oil imports," he added.

According to the Ministry of Commerce and Industry, India's merchandise imports were $61.68 billion and exports were $33 billion in August 2022, leaving a deficit of $28.68 billion. During April-August 2022-23, India's merchandise imports were $317.81 billion while exports were $192.59 billion, leaving a gap of $125.22 billion. The top five export items are: engineering goods, petroleum products, gems and jewellery, organic/inorganic chemicals, drugs and pharmaceuticals. Similarly, the top import items are: petroleum, crude and products; electronic goods; coal/coke; machinery - electrical/ non-electrical; gold; organic/inorganic chemicals. The fall in global oil prices will help reduce the trade deficit. Further, with India buying huge amounts of oil from Russia at a discount and the talks of rupee invoicing of oil imports would ease the trade deficit, Jamal Mecklai, CEO, Mecklai Financial Services Private Ltd, said.

It should be noted that Russia is now a major source of crude as well as fertilisers for India. However, Russia closing its oil tap to Europe is expected to have an adverse impact on India's import bill as the oil and gas prices will increase. Further, with the energy costs increasing in Europe, the cost of imported items is expected to go up. The way to improve the trade balance is to boost exports, which the government is doing through its policies. But exports are driven more by demand in the overseas market, Sabnavis pointed out. The increasing interest rates overseas to curb inflation may dampen exports, while the pent-up demand in the domestic market boosts imports, thereby widening the trade gap. A trade deficit is bad for an economy as it puts pressure on the current account deficit, which is the trade account plus invisibles account (includes software, remittance, travel tourism and others), said Sabnavis.

According to Moody's Investors Service's Credit Opinion on India, the country's foreign exchange reserves have fallen to $511.3 billion in July 2022 from $569.9 billion at the end of 2021, reflecting a widening in the current account deficit resulting primarily from higher global prices for India's imported energy inputs. In particular, India's imports of crude oil and petroleum products rose 83.7 per cent year-on-year over the first seven months of the year; consequently, over the same period, the balance of trade in crude oil and petroleum products gapped to Rs.6.1 trillion (2.7 per cent of 2021 GDP) from Rs 3.5 trillion (1.5 per cent of 2021 GDP).

We now expect the current account deficit to widen to 3.9 per cent of GDP in fiscal 2022 from 1.2 per cent in fiscal 2021," Moody's said. Be that as it may, the Indian government has to balance the domestic interests vis-avis the exports revenue. It has already banned wheat and broken rice exports. In order to make India a global production base, the government has come out with schemes like production linked incentive (PLI) for various sectors and it is also mulling such a scheme for other sectors.

Redesigning of Commerce department underway, govt. to set up ‘trade promotion body’ to promote trade

Piyush Goyal, Union Minister for Commerce and Industry, said that the redesigning of the Commerce Department is under process and the Ministry will come up with a plan after thoroughly studying the received reports suggesting the new structure.

Piyush Goyal while addressing a media briefing said, "We are in the process to redesign the structure of the Commerce Ministry and one of the ideas in front of us is to set up a 'trade promotion body', similar to 'Invest India'. It is a facilitation unit that will promote trade from India, for India."

As part of the restructuring exercise, a dedicated trade promotion body would be set up to devise an overall strategy to achieve targets and make it future-ready," Goyal had said earlier.

The Union Minister said that there were a number of suggestions on some roles that government could do to connect ideas and entrepreneurs from here with potential partners or stakeholders in India.

According to an earlier statement from the Commerce Ministry, the Department of Commerce is set to undergo transformative changes towards evolving into a 'future ready' establishment of the Government with scaling up, strengthening, and infusion of 'new age' capabilities leading to an ecosystem which can achieve $2 trillion exports by 2030.

Goyal said restructuring of the entire department of commerce aims at preparing India to become a key global player in world trade.

He further said the restructuring rests on 5 major pillars: Increasing India's share in global trade, assuming the leadership role in multilateral organisations, the democratisation of trade, creating 100 Indian Brands as Global Champions, and setting up Economic Zones in India to strengthen the manufacturing base and attract greater investments to India.

FTA may boost India's exports to Bangladesh by $10 billion in five years

India’s exports to Bangladesh may increase by additional $10 billion in a time span of five years if both countries sign a free trade agreement (FTA), the joint study conducted by both countries for the proposed Comprehensive Economic Partnership Agreement (CEPA) said.

Similarly, for Bangladesh, the potential of additional exports to India could range from $3 billion to $5 billion in a time span of 10 years. "The total additional potential bilateral gains in trade in goods due to a possible CEPA ranges between $7 billion to $15 billion,” the report said.

India’s largest increase in exports to Bangladesh will be observed for motor vehicles, cotton, man-made filaments, albuminousidal substances, electrical machineries and equipment, iron and steel, knitted or crocheted fabrics, plastic goods, machineries and mechanical appliances, paper, and paper products.

For Bangladesh, export gains could occur in board categories such as textile and apparel goods, containers of iron/steel, wooden furniture, parts of machineries, plain woven fabrics of cotton, plastic products, chocolates, inorganic chemicals, finished leather, leather bags, footwear, processed foods such as biscuits among others.

In a joint statement after the meeting between visiting Bangladesh Prime Minister Sheikh Hasina and Prime Minister Narendra Modi, both sides said the two leaders welcomed the recent finalisation of a Joint Feasibility Study that recommended that CEPA will be beneficial for both the countries. “They directed trade officials on both sides to start negotiations within the calendar year 2022 and to complete these at the earliest, in time for Bangladesh’s final graduation from LDC (least developed country) status,” it added.

Bangladesh is on track to graduating from LDC status in 2026 after which it will no longer be eligible to continue to put high tariffs and will have to provide duty-free quota-free market access to India under the existing (South Asian Free Trade Area) SAFTA commitments.

The joint study said though gains for Bangladesh’s exports to the Indian market from a CEPA will not be large as it is already enjoying duty free quota free market access, the FTA will be crucial for it from the perspective that it is soon going to lose the LDC status.

The bilateral trade between India and Bangladesh has been growing significantly over the past few years with India enjoying the second-largest trade surplus with its eastern neighbor after the US. Bangladesh became India’s fourth-largest export destination in FY22, jumping five places in two years.

Nisha Taneja, professor at ICRIER, said the India-Bangladesh CEPA would not only lead to enhanced trade but was also likely to have wider economic benefits for the BBIN (Bangladesh, Bhutan, India, and Nepal) sub-region and the BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) region.
“The CEPA will become the cornerstone for India’s Act East Policy as it would integrate India’s northeast region to the hinterland and to the neighbouring countries as well. CEPA will also encourage the development of global and regional value chains through greater investment flows. Removing regulatory barriers will lead to enhanced trade in services in health, education, IT and tourism. A sector which holds immense potential is e-commerce — the two countries could work together to address regulatory issues which would smoothen and enhance cross-border e-commerce trade,” she said.


India to push for a review of FTA with Japan

Financial Express | 09 September 2022

India will seek a “long over-due” review of its free trade agreement (FTA) with Japan when commerce and industry minister Piyush Goyal meets his Japanese counterpart Nishimura Yasutoshi in Los Angeles.

Both the countries had adopted the Comprehensive Economic Partnership Agreement (CEPA) in August 2011. However, India’s trade deficit with Japan has only exacerbated after that, prompting New Delhi to review the FTA to restore greater trade balance. Domestic steel makers have often complained about a surge in imports from Japan as a consequence of the FTA. While India’s exports to Japan stood at just $6.2 billion in FY22, its imports hit $14.4 billion.

Both Goyal and Yasutoshi, the Japanese minister of economy, trade and industry, are in the US to attend the Indo-Pacific Economic Framework ministerial, which is taking place on September 8-9. They are scheduled to hold bilateral meetings as well.

Asked if the review of the FTA with Japan will be taken up soon, Goyal said: “I think that’s quite long overdue and I am going to raise that issue with my counterpart from Japan. He has just taken over some time ago as a new minister. So, I will be taking up that issue.”

Goyal said an interim deal with Australia is expected to be ratified by the Australian Parliament by the end of this year. The deal was signed in April, just before Australia went on an election mode.

Goyal said Australia’s new trade minister Don Farrell “has assured me that they are very pleased with the outcome of the Indo-Australian negotiations and the trade agreement that we finalised, and that they (Australia) will be putting it through Parliament soon”. Farrell is visiting India later this month to discuss trade issues with Goyal.

Asked about his upcoming bilateral meeting with US Trade Representative Katherine Tai on the sidelines of the IPEF ministerial, Goyal said the meeting is a “follow-up” of their usual engagement to boost bilateral trade. The US is India’s largest export destination. It accounted for New Delhi’s merchandise despatches worth $76 billion in FY22, or 18% of its total exports.


Indo becoming world’s 5th largest economy no ordinary feat

The Print | 08 September 2022

India has emerged as the fifth largest economy in the world and this is not an ordinary achievement, Prime Minister Narendra Modi said.

“Recently, India achieved the feat of becoming the world’s fifth largest economy. This achievement gave us confidence to work harder and achieve bigger goals in this Amrit Kaal,” Modi said.

On September 2, the International Monetary Fund (IMF) announced that India had surged past the United Kingdom to become the fifth largest economy in the world. The latest change in rankings is based on quarterly gross domestic product (GDP) numbers in current dollars for the period ending December 2021. India increased its lead over the UK in the quarter ending March, IMF data showed.


Until we get a good deal, no trade pact with Israel

The Print | 07 September 2022

The proposed India-Israel trade pact should be beneficial to both nations and until New Delhi gets a good deal, it would not do an agreement, Commerce and Industry Minister Piyush Goyal said.

India and Israel are negotiating a free trade agreement (FTA) since May 2010.

“With Israel, until we get a good deal, we will not do an FTA. It has to be reciprocally beneficial,” the minister said while interacting with the Indian community.

Major exports from India to Israel include precious stones and metals, chemical products and textiles and textile articles while imports include precious stones and metals, chemicals and mineral products, base metals and machinery and transport equipment.

The bilateral trade in goods between the two countries stood at about USD 8 billion in 2021-22. It was USD 4.7 billion in 2020-21.
Propelling exports, the DESH way

Business Line | 07 September 2022

Goyal said active negotiations are going on with several countries on trade pacts.

With Canada, he said “we could possibly see early progress in trade agreement or interim trade agreement by end of the year or early next year”.

With the EU, he said as it is a 27-nation bloc, the proposed trade pact with it would probably take a year-and-half or two.

“We have three other sets of countries – the Russian group of five countries, Switzerland and a group of 3-4 countries that are very very keen to do FTA with India.

“I am trying to assess whether Switzerland and other countries bring something substantive to the table which is good for India. The (Swiss) minister is coming in a week or two to India, the agenda is FTA. Last time, I had kind of conclusively said we are not very keen on this. If he gives me an offer I can’t refuse, may be we will do it,” he said.

Talks with the GCC, he said, are at advanced stage for preparing the scope of the trade pact and negotiations for that may be launched “very soon”.

The Gulf Cooperation Council (GCC) is a union of six countries in the Gulf region, namely, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE.

The European Free Trade Association (EFTA) members are Switzerland, Norway, Iceland and Liechtenstein. The Eurasian Economic Union (EAEU) comprises Russia, Armenia, Belarus, Kazakhstan and Kyrgyzstan.

https://theprint.in/economy/until-we-get-a-good-deal-no-trade-pact-with-israel-goyal/1119362/

Indian exports to China dip by a third in April-August to $6.8 billion

Business Standard | 05 September 2022

Amid a slowdown in economic activity in China, India’s exports to its northern neighbour dropped 35 per cent to $6.8 billion during April-August period at a time the country’s overall exports rose 17.1 per cent. China became India’s fourth largest export destination during the period,

After missing out on global trade opportunities in the past, there is now a renewed focus by the Commerce Ministry to evolve an enabling policy framework which can foster an ecosystem of innovation and research, mobilise foreign investment, synthesise the export and logistics ecosystem and bring synergies among different sectors.

All these efforts are aimed at achieving the much-required global competitiveness in India’s manufacturing and services.

In the Budget 2022-23, the Finance Minister had proposed the replacement of the SEZ law with a new legislation - Development of Enterprise and Service Hubs (DESH). The primary objective of DESH is to create an export promotion ecosystem, aligning trade policy framework with the WTO rules, inculcating the spirit and enthusiasm among entrepreneurs, ensuring greater transparency in business ecosystem and mobilising international investments especially under the ‘China plus One’ strategy and Supply Chain Resilience Initiative (SCRI).

The DESH Bill is aimed at addressing many of the shortcomings of the hitherto SEZ Act. A few sectors such as IT & IT enabled services, gem and jewellery, pharma have benefited under the SEZ Act but they failed in facilitating a large scale economic transformation vital for a country like India.

https://www.thehindubusinessline.com/opinion/propelling-exports-the-desh-way/article65862692.ece

India scales higher in exports

Deccan Chronicle | 06 September 2022

India, believed by many to have the potential to become the next China, is finally making headway in the exports market as it broke into the top 5 suppliers of Christmas decorative items and t-shirts to the US.

Sea-borne shipments of festival goods and accessories to America touched $20 million last month, almost triple the value from the year ago period, according to US customs data.

In the process, India gained a clear lead over the Philippines as buyers diversify supply sources in the face of rising labor costs and disruptions from China’s strict Covid-zero policy.

The trend isn’t limited to Christmas goods. Exporters in Asia’s third largest economy have been witnessing a significant increase in orders from both the US and Europe, with the shift mostly seen in low-cost, labour-intensive sectors such as apparel, handicrafts and non-electronic consumer goods.

While diversification of supply chains began with the US-China trade war in 2018, India hadn’t seen any meaningful gains back then as countries such as Vietnam cornered the bulk of orders that were moving away from Beijing.

By 2030, India is projected to have the world’s most abundant labour force, and could contribute over $500 billion annually to the global economy, according to a report by Kearney and the World Economic Forum.

https://www.pressreader.com/india/deccan-chronicle/20220906/282114935403604

Indian exports to China dip by a third in April-August to $6.8 billion

Business Standard | 05 September 2022

Amid a slowdown in economic activity in China, India’s exports to its northern neighbour dropped 35 per cent to $6.8 billion during April-August period at a time the country’s overall exports rose 17.1 per cent. China became India’s fourth largest export destination during the period,
slipping from the second position during the same period a year ago.

Multiple shocks have hit China’s economy, including the drag on consumption from the zero-Covid policy, the prolonged impact of the property sector downturn and declining export demand, all of which have slowed down economic activity.

While exports of petroleum products such as naptha to China rose 81 per cent to $1.2 billion during April-July due to elevated crude oil prices, shipments of organic chemicals (-38.3 per cent), iron ore (-78.5 per cent) and aluminium products (-84.2) saw sharp decline, disaggregated data available on Commerce Ministry website showed. However, China increased its imports of non-Basmati rice (141.1 per cent) and marine products (18.7 per cent) during the period. A cut in steel output in China has also led to sharp dip in iron ore exports from India.

On the other hand, imports from China were up 28 per cent during April-August at a time when India’s overall imports grew 45.6 per cent, leading to a trade deficit of $37.1 billion in the first five months of FY23.

India’s rising trade deficit with China—the highest with any country—has been a cause for concern. “The growth of trade deficit with China could be attributed to two factors: narrow basket of commodities, mostly primary, that we export to China and market access impediments for most of our agricultural products and the sectors where we are competitive in, such as pharmaceuticals, IT/ITeS, etc. Our predominant exports have consisted of iron ore, cotton, copper, Aluminium and diamonds/natural gems. Over time, these raw material-based commodities have been over-shadowed by Chinese exports of machinery, power-related equipment, telecom equipment, organic chemicals, and fertilizers. We continue to engage the Chinese side for addressing market access issues,” the Indian Embassy in China explains on its website.

China’s economy is bracing for more pain as Chengdu’s lockdown, the sixth largest city in the country’s west, damaged business and consumer activity in the area and hurt sentiment more broadly. The hit to global production and shipping from China’s strict Covid lockdown policies have also set back recovery in global supply-chain activity.

Moody’s last week lowered its growth forecasts for China for both 2022 and 2023 to 3.5 per cent and 4.8 per cent, respectively, down sharply from 8.1 per cent in 2021.

July trade data showed a surge in China’s trade surplus to a record $101.26 billion, up from $97.4 billion in June. “China’s recovery beyond 2023 will depend on knock-on effects on other sectors resulting from troubles in the property sector and measures by authorities to stabilize it, and the impact on households’ balance sheets and their consumption-saving decisions. A strong revival of domestic consumption demand, alongside the increased infrastructure spending that the government is already undertaking, will be key to sustaining a solid recovery,” Moody’s said.


Trade data shows global impact as FTAs in focus

Hindustan Times | 03 September 2022

India’s merchandise exports in August dipped marginally at $33 billion as compared to $33.38 billion in the same month a year ago mainly because of global headwinds, including the Chinese slowdown, according to official data.

The government, however, is confident of achieving record $750 billion goods and services exports in FY23 as it plans several policy measures under the New Trade Policy expected by the end of this month.

India’s merchandise import in August 2022 was $61.68 billion, an increase of 36.78% over $45.09 billion in the corresponding month of 2021. Experts expressed concerns about rising imports in comparison to exports, which had been a drag on the country’s gross domestic product (GDP) in the first quarter of the current financial year.

EY India chief policy adviser DK Srivastava said: “The contribution of net exports to real GDP growth is negative at (-)6.2% points in 1QFY23 since import growth continues to exceed export growth by a tangible margin.” India’s GDP grew at 13.5% in Q1 FY23, lower than the 16.2% forecast by the Reserve Bank of India (RBI).

Commenting on the latest trade data, commerce secretary BVR Subrahmanyan said merchandise exports this month are “flat” due to several global headwinds such as the Ukraine war, high inflation, hardening of interest rates in major economies and the Chinese slowdown.

Expressing confidence in India’s resilient economy, he said exports growth is not off-track and according to conservative estimates, the country can achieve exports of $300 billion services and $450 billion goods by March 31, 2023. He said India’s free trade agreements (FTAs), forthcoming New Trade Policy, and the government’s Aatmanirbhar Bharat Abhiyan (Self-reliant India initiative) would aid this target.

“India’s exports are holding ground” compared to other global economies, with a 17.1% merchandise exports
growth in the first five months of current financial year at $192.59 billion and robust services exports at $95 billion in April-July 2022 registering 25% growth, he said. With that kind of cumulative growth “we are not in a very uncomfortable situation”, he added.

Subrahmanyam said exports restrictions on several commodities to tame the country’s inflation and a slowdown in the Chinese economy, which is one of the largest trading partners of India, has adversely impacted exports growth. According to official data, India’s exports to China fell by about 35.6% to $6.8 billion in April-August 2022 compared to $10.5 billion in the same period previous year. India’s imports from China, however, surged by 28% in the first five months of 2022-23 at $43.90 billion.

India’s high imports are mainly due to the country’s dependence on petroleum products, edible oil and other commodities that have seen a spike in their rates in the international market, the commerce secretary said. India, which imports 85% of crude oil it processes, saw its daily average import cost at $102.04 a barrel on August 30, an 11.58% jump since August 17 ($91.45). In April-July 2022, India imported crude oil worth $64.17 billion.

Subrahmanyam said Chinese slowdown is also an opportunity as India is the world’s fastest growing country, which has surpassed the United Kingdom, and many global economies are now relying on New Delhi for assured supply of goods and services. “Several countries are eager to have trade ties with India and recent FTAs are efforts in that direction,” he said. While the FTA with the United Arab Emirates (UAE) is already operationalised, the FTA with Australia is expected to be operationalised by November, another government said, asking not to be named.

The commerce secretary said India’s FTA with the United Kingdom is “on the last stage” as “our fingers are touching” and a meeting is expected in the last week of the month so that the deal can be closed by Diwali. While an FTA with Canada is also on the fast track and expected to be concluded by December this year, and the trade agreement with the European Union (EU) is expected in June-July, he said.


Goyal to attend IPEF ministerial in US next week; focus on trade ties

Business Standard | 02 September 2022

Commerce and Industry Minister Piyush Goyal will attend the first in-person Indo Pacific Economic Framework for Prosperity (IPEF) ministerial in Los Angeles on September 8-9, an official statement said.

The minister will hold bilateral meetings with US Secretary of Commerce Gina Raimondo and US Trade Representative Katherine Tai on the sidelines of the ministerial meeting with an eye on strengthening trade and economic ties between both nations.

Goyal will be on a six-day visit to San Francisco and Los Angeles, which will also include attending the India-US Strategic Partnership Forum conference. During his visit, he will interact with eminent business persons, US officials and industry leaders to fortify the partnership between the two nations and strengthen trade and economic ties.

“The US is a very important strategic, trade and commercial partner. This visit is very important for India in that regard… He (Goyal) will also attend the IPEF ministerial, in which he will also be interacting with the counterparts from the rest of the (IPEF) member countries,” a senior government official said. “This meeting will enable ministers to have detailed discussions and expect the core elements of each of the four pillars (of IPEF) and broad scope of engagement and possibly some mechanisms on how these engagements will go forward will emerge from these discussions,” the official said, referring to the agenda of the meet.

The IPEF was launched jointly by the US and other partner countries of the Indo-Pacific region on the sidelines of the Quad Summit in Tokyo on May 23. It seeks to strengthen economic partnership among participating countries with the objective of enhancing resilience, sustainability, inclusiveness, economic growth, fairness and competitiveness in the region. IPEF is also seen as an economic initiative to counter China’s influence in the South and Southeast Asia.

This is the first plurilateral deal that India has agreed to join after exiting RCEP deal at the last minute in 2019. Apart from India and the US, the 12 other members of the IPEF are Australia, Brunei, Fiji, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, and Vietnam.


Chemicals and Petrochemicals

CIL to ink MoU with three PSUs for setting up coal-to-chemical projects

Business Line | 23 September 2022

Coal India Ltd (CIL), under the aegis of Ministry of Coal, will ink
The memorandum of undertaking (MoU) with three major PSUs for setting up of coal-to-chemical projects through Surface Coal Gasification (SCG) route on September 27 in New Delhi.

The state-owned miner will be joining hands with Bharat Heavy Electricals Ltd, Indian Oil Corporation and GAIL (India) for setting up four SCG projects, the government said in a statement.

Through SCG route coal is converted into syngas that can be subsequently processed for downstream production of value-added chemicals. These are produced through imported natural gas or crude oil. Some of the end products would be di-methyl ether, synthetic natural gas and ammonium nitrate.

Coal India to sell around 90 mt coal through e-auction route

The state-owned miner has been earning close to ₹4,400-4,500/tonne on sale through e-auction route this year.

The proposed projects would not only help reduce forex outgo but would also lead to direct and indirect employment generation to the tune of 23,000.

With the twin objectives of self-reliance and energy independence, the Coal Ministry has set a target for achieving 100-million-tonne coal gasification by 2030, the release said.

In its latest annual report (2021-22), CIL said it had completed pre-feasibility studies during the year to set up integrated coal-to-chemical plants utilising low-ash coal. These plants are proposed to be located near mine heads of ECL, SECL and WCL to produce methanol, ammonia and ammonium nitrate, respectively. Tendering process was on, it said.

Plans are also on the anvil for setting up a C2C plant utilising high ash coal, to produce ammonium nitrate (AN) at MCL to cater the requirement of coal producing subsidiaries. AN is an important component in manufacture of explosives, extensively used in the mines of Coal India.

India initiates safeguard probe into sudden jump in imports of certain plastics

India has started a safeguard probe into sudden increase in imports of certain kind of plastics, following a complaint by domestic industries.

The Directorate General of Trade Remedies (DGTR) has initiated the investigation into imports of PVC suspension resins with residual VCM above 2 PPM, which is used in different industries such as pipes, packaging, wiring and insulations, and medical products.

According to a notification of the DGTR, Chemplast Cuddalore Vinyls, and DCW Ltd have filed an application to initiate the probe.

They have alleged that there has been a sudden, sharp and recent increase in the volume of the imports in India which has started causing serious injury to the domestic industry and is posing threat of further aggravated injury, it said.

Accordingly, the companies have requested for imposition of safeguard measures in the form of quantitative restrictions on the imports. “On the basis of the duly substantiated application filed by the petitioners, and having satisfied itself on the basis of the prima facie evidence submitted by the domestic industry, the authority considers that there is sufficient evidence to justify initiation of safeguard investigations...,” the notification said. In the probe, the DGTR would determine whether imports have increased suddenly and sharply in the recent period and as a result of unforeseen developments, and whether such increased imports have caused or posed a threat of serious injury to the domestic industry, it added. Safeguard measures in the forms of duty of quantitative restrictions are trade remedies available to the World Trade Organization member-countries. They are imposed to provide a level-playing field to domestic players in case of sudden and significant increase in imports of a product.

Flue Gas Desulfurization System Market is Expected to Secure US$ 34,881.3 Million in 2032

International awareness of environmental concerns has been increasing in recent years resulted in the stringent environmental regulations regarding sulfur dioxide (SO2) emission in the many countries. Flue Gas Desulfurization System (FGDS) is a set of technologies which works to remove sulfur dioxide (SO2) from exhausted gases from the emission of the sulfur dioxide emitting processes.

Basically, the flue gases are removed using a variety of reagents such as caustic, lime, fly-ash, magnesium oxide, soda ash, sea water, limestone, ammonia and double alkali. The flue gas desulfurization system efficiency is based on the reagents and the type of the technology used to desulfurize the Sulfur dioxide (SO2). The FGDS are available in size range from 5 MW to more than 2000 MW capacity.

The global FGDS market is expected to show a rapid market growth...
over the forecast period. The sulfur dioxide is responsible for the acid rain formation, the stringent government regulations to protect the environment have been implemented in many countries to limit and control the emission of the flue gas which is the major factor driving the global FGDS market.

https://marketresearchblog.org/2022/09/flue-gas-desulfurization-system-market-is-expected-to-secure-us-34881-3-million-in-2032/

### Chemicals & petrochemicals sector can transform India into a global manufacturing hub: Mandaviya

*Indian Chemical News | 20 September 2022*

“Chemicals and petrochemicals sector can transform India into a global manufacturing hub in sync with PM Narendra Modi ji’s vision of ‘Make in India, Make for the World,’” said Dr Mansukh Mandaviya, Union Minister of Chemicals & Fertilizers and Health & Family Welfare, at the third meeting of Chemicals and Petrochemicals Advisory Forum. MoS Chemical & Fertilizers Bhagwanth Khuba was also present at the event.

While addressing the occasion, Mandaviya stated that the Indian chemical and petrochemical industry has a substantial potential to play a significant role in boosting the nation's growth. “India needs to create its own model to lead the global market in chemicals and fertilisers”, he stressed.

Mandaviya urged the companies and the Advisory Forum to create a “futuristic strategy which would be in sync with the global demands and the emerging requirements of aligned industries. India has the capacity to rise to the challenge; what is needed is a strategy which is focussed on outcomes”.

“Let us create our own model of decision making which is consultative and multi-pronged, while identifying actionable points to take India to the height of meeting its own domestic demand and the global one too,” Mandaviya highlighted. He also urged the industry and academia to partner in R&D which addresses the domestic requirements in the sector. “We could have targeted R&D to meet the challenges and requirements of niche sectors such as MSME for chemicals,” he noted.

While addressing the event, Khuba highlighted the industry-friendly policies of the government, and various initiatives taken for easy-of-doing business in the country. Noting that India is a rising economy, he stated that Indian chemical and petrochemical industries have huge potential to play and a significant role in boosting the nation's growth.

https://marketresearchblog.org/2022/09/flue-gas-desulfurization-system-market-is-expected-to-secure-us-34881-3-million-in-2032/

### A Promising opportunity to become hydrogen hub: P.D. Samudra, Former CEO & MD, Thyssenkrupp Industrial Solutions (India)

*Indian Chemical News | 16 September 2022*

The growth of renewables and renewable powered Hydrogen production has created global momentum for “Green Hydrogen” as a clean fuel, as well as energy storage option. More than 95 percent of world Hydrogen (which is approximately 90 MMTPA) is produced from fossil fuels via Steam Methane Reforming Process (SMR) or via Coal Gasification Route (CGR). Such production of the Grey Hydrogen leads to emission of CO2 in the range of 10 Kgs/Kg of Hydrogen in the SMR process or 5 Kgs/Kg in the Coal Gasification Route, which has been the cause of great concern from an environmental point of view.

During the United Nation Climate Change Conference (COP 26) at Glasgow, more than 30 countries and the European Union pledged their nationally determined contribution in order to ensure energy transition in phases and thereby reduce emissions. Many large economies including India have committed to the “Net Zero” targets, within the next 3 to 5 decades.

The “Green Hydrogen” is expected to revolutionise the energy and feedstock sources for several applications including oil refining processes, production of fertilizers, Ammonia and Methanol as fuel, steel plants, transportation sector, injections in natural gas pipelines grid, synthetic fuels, buildings, etc.

The existing worldwide production of over 90 MMTPA is expected to increase by more than double to around 200 MMTPA by 2030, mainly using renewable energy sources such as solar and wind power for the electrolysis process for production of Green Hydrogen.

Presently, India is one of the large consumers of Hydrogen with approximately 7 percent of world’s capacity i.e. approximately 7 MMTPA is produced mainly from fossil fuels like natural gas. On 17th February, 2022, the Government of India published Green Hydrogen Policy to boost up domestic production of Green Hydrogen to 5 MMTPA by 2030; thus paving a way to make India march towards net zero and creating potential for exports.

Economical production of “Green Hydrogen” in comparison to conventional “Grey Hydrogen” is presently the challenge mainly due to high capital costs of the electrolysers which contain components made from exotic materials.

Leading Indian companies are putting
in large efforts to improve upon the local supply chain to reduce Capex. The costs of energy inputs like solar power are expected to reduce further as huge capacities are being set up. In the near future, the target is to reach the price of Green Hydrogen to the levels of US $2 - US $2.5 per Kg.

A large number of Indian public and private sector companies have started preparing for such a change over to Green Hydrogen and are in process of making tie ups with BOO (Build, Own, and Operate) operators and technology suppliers.

Renewable energy being the main source for production of Green Hydrogen via electrolysis of water, it is very important to understand the steps already taken by India in terms of availability of renewable energy.

As per Government's National Electricity Plans, the installed capacity for electric power generation of 393 GW as of 31st December, 2021 is expected to undergo quantum jump to the level of 832 GW by end of the year 2030. Remarkably, the share of renewable sources based electric power (mainly solar and wind) will increase from present 18 percent to 44 percent, thus providing a huge capacity of renewables based energy to the tune of 400 GW, mainly coming from solar and wind power. Therefore, with such continued increase in renewable energy, India will be certainly poised within a decade not only to cater to internal demands of Green Hydrogen but also venture to export in a big way.

There are new exciting environment friendly opportunities emerging for India to become a Green Hydrogen hub which could lead to changes in old concepts of producing energy for our own usage with a good potential for its export in the near future.


**Europe gas crisis could be an opportunity for Indian chemical players**

**CNBC TV 18 | 12 September 2022**

The sharp spike in European energy prices continues to have a bigger impact across sectors. Cut in Russian gas supplies have resulted in a sharp jump in electricity costs in Europe and this has impacted the production of energy-intensive chemicals like ammonia, methanol, melamine, etc. In some cases, production has been cut by more than 50 percent.

BASF in its second half outlook for this year did indicate that risk could arise due to gas shortage in Europe and this will be compensated by higher planned capacity utilisation at sites outside of Europe.

As per the report by Bloomberg, CRU Group Estimates that Europe now has lost half of its ammonia capacity, and 33 percent of nitrogen fertiliser operation. Now that is a big number considering that you are contributes roughly 20 percent of total global ammonia production.

To produce one tonne of ammonia, around 36 MMBtu of natural gas is consumed, and every $1 per MMBtu increase in gas price would mean that ammonia’s variable costs will increase by $36 per tonne. So with gas prices increasing by say $50 to $70 per MMBtu in Europe, variable costs of ammonia production have increased by $1500 to $1,800 per tonne.

Now in the Indian context, companies like GNFC and RCF are some of the producers of ammonia, but it does not stop here. Ammonia is used to produce nitric acid, ammonium nitrate and due to the higher costs cost of production of nitric acid, it has increased by $200 per tonne to around $600 to $800 per tonne.

Aarti Industries uses nitric acid as raw material and to shield themselves they did announce setting up a nitric acid plant. In terms of producers, Deepak Fertilisers, GSFC and GNFC are the nitric acid producers in the country.

Industry sources are suggesting that other chemical plants like melamine, caprolactam, methanol are also running at lower capacity in Europe. Now, this has been confirmed by some of the Indian chemical players as well.

Meghmani Finechem told CNBC-TV18 that caustic soda prices are expected to stay at higher levels due to energy prices in Europe. Aarti Industries said that Indian chemical players are benefiting due to production issues in Europe and that is something that could be the big theme.

Morgan Stanley did indicate in July that since European peers are facing challenges with respect to gas costs this could benefit Asian and particularly Indian chemical players, which are well positioned to take market share. Whether Indian chemical players will grab this opportunity or not, only time will tell.


**European energy crisis could wreak havoc on chemical producers**

**Live Mint | 09 September 2022**

The energy crisis in Europe amid lower gas supplies is hurting industries in the region. The cut in Russian gas supplies has resulted in a sharp jump in electricity costs for European countries.

Energy-intensive industries such as steel, aluminium and other metals are already seeing production cuts due to the crisis. Chemical companies being energy intensive could also see an impact on production.
Analysts at JM Financial Institutional Securities Ltd said that further cuts in Russian gas supplies could wreak havoc on European chemicals producers, which are highly dependent on natural gas. As a result, in Europe, the production of various energy-intensive chemicals such as ammonia, caprolactam, methanol, melamine, etc. has been slashed by more than 50% in some cases of the available capacity, as per industry reports, they added.

Europe accounts for about 20% of global ammonia production. Thus, a significant ammonia capacity shutdown could keep ammonia prices elevated. Analysts at JM Financials said that this should result in a jump in prices of ammonia-based chemicals and fertilisers, globally. The same may not be good news for global agrochemical and fertiliser makers.

While on one hand the margins and earnings may see the impact, pass on of higher prices could mean higher costs for crop producers, leading to higher agri prices and thereby inflation. In India, ammonia is produced by Gujarat Narmada Valley Fertilisers Chemicals (GNFC), and Rashtriya Chemicals Fertilisers (RCF), amongst others. Deepak Fertilisers’ ammonia plant is scheduled for commissioning by August’24;

The market for other energy-intensive chemicals such as caustic soda, and soda ash could also remain in tight balance, feel analysts.

The caustic soda production as per analysts requires power consumption of 2,300-2,450 kWh/tonne (translating to a variable cost of Euro 1,000-1,100/tonne) say, analysts. We believe European caustic soda production (15-20% of global) could also face challenges, said JM Financials analysts. This is likely to keep the caustic soda market supplies tight. In India, Gujarat Alkali, Chemfab Alkali, Punjab Alkali, and Meghmani Finechem are some of the caustic soda producers.

Even Grasim may be among the beneficiaries. Grasim is executing a 30% plus expansion in caustic (FY22-FY25), and doubling in epoxy which would provide fillip to its volume growth, said analysts at Jefferies India.


Soda Ash Market will Record a Sluggish 4.0% CAGR through 2029

Pegged at a steady CAGR, global revenue of soda ash market is set to US$ 25,285.6 Mn in 2029. The upsurge in revenue is accredited to greater uptake of soda ash in glass & ceramic industry, particularly container glass and flat glass. Moreover, variegated end-use segments such as chemicals, construction, metallurgy, soaps & detergents are generating soaring demand for soda ash, concludes the FMI report.

Manufacturers in soaps & detergents industry increasingly favour soda ash as a substitute for traditionally-used phosphates. Soda ash has become a crucial ingredient for numerous cleaning products. It is transforming the energy sector owing to its recyclability and reusability. Moreover, soda ash market is gathering strong impetus in developing countries with proliferation of high net worth income individuals.

https://marketresearchblog.org/2022/09/soda-ash-market-will-record-a-sluggish-4-0-cagr-through-2029/

**Expect PVC will be dumped in India and hence a downward trend:**

**Finolex CEO**

*The Economic Times | 06 September 2022*

Volume-wise. we are yet to cross the pre-Covid levels. Our first target would be to try and see whether we can move past the pre-Covid numbers. We are optimistic about it. We are seeing some positive indications from the housing market, good rains have also given us some hope we have to wait and see,” says Ajit Venkataraman , CEO, Finolex Industries.

Asian PVC prices have fallen 30% in the last three months and your company immediately passed these on to the consumers. Going forward, do you see the macro headwinds continuing and the impact of the Q2 numbers or do you think the worst is behind us?

Headwinds are coming from various markets. China, Europe and the US are going through a housing crisis. We expect that PVC will be dumped in India and therefore we are already seeing a downward trend. We are seeing the bottom of it but it is we have to wait and see.

Can we make a conclusion that margins will remain under pressure in Q2 but given you are seeing some signs of bottoming out, you are confident that margin may improve in the next six months?

See Q4 and Q1 are the best quarters for us historically and with good rains, we are expecting that the market will start showing green shoots soon. We have to wait and see because margins depend on the price of PVC, the market and also the product mix we have got. It is tough to predict at this point of time but yes we are hoping for the best.

Volumes have been a bit subdued this year and PVC demand from the Chinese realty sector has been weak. Could you talk to us about what kind of volume growth you are pencilling in for FY23? Can we expect any turnaround in the second half of this year? We are yet to cross the pre-Covid levels. Our first target would be to try and see whether we can move
past the pre-Covid levels. We are optimistic about it and it all depends upon how the market picks up. We are seeing some positive indications from the housing market, good rains have also given us some hope we have to wait and see. Over the past two years, demand for agriculture pipes has been much lower than plumbing pipes. Almost 60-70% of NSE 0.08 % pipe demand comes from the agriculture sector. What is the outlook specifically? Our product mix is also changing. Currently, 60% comes from the agri sector and 40% from the non-agri sector. This trend is likely to continue but there is enough headroom to grow even in agri business. Less than 50% of our farm is through irrigation. It is mostly through rain irrigation and we expect enough headroom to grow in this segment as well.


China to lead caustic soda capacity additions in Asia: Report

Chemical Weekly | 06 September 2022

China will register the highest caustic soda capacity additions in Asia, contributing about 41% of the region’s capacity additions by 2026, estimates Global Data, a leading data and analytics company.

Global Data’s latest report reveals that China leads with the largest capacity additions globally, with a capacity of 2.30-mtpa from six planned projects.

Ms. Sudarshini Ennelli, Oil and Gas Analyst at Global Data, informed, “In China, the major capacity addition will come from a planned project, Xinjiang Zhongtai Chemical Company Baicheng Caustic Soda Plant, with a capacity of 0.80-mtpa. It is expected to commence production of caustic soda in 2024”.

Tianjin Bohai Chemical Development Company Tianjin Caustic Soda Plant follow with second highest capacity additions of 0.60-mtpa by 2030. The plant is expected to commence operations by 2022.

“Fujian Southeast Electrochemical Fuzhou Caustic Soda Plant 2 and Guangxi Huayi New Materials Qinzhou Caustic Soda Plant 1 are the third highest contributors in terms of capacity additions in the country accounting for 0.30-mtpa capacity each. Both the plants are expected to commence production of caustic soda by 2023,” Ms. Sudarshini noted.

NTPC starts capturing CO2 from flue gas stream at power plant

Chemical Weekly | 06 September 2022

NTPC Ltd., India’s largest integrated power company, has started capturing carbon dioxide (CO2) from the flue gas stream at its 500-MW coal-based power plant (Unit-13) at Vindhyachal Super Thermal Power Station (VSTPS), with effect from August 15, 2022.

According to a company statement, the plant is designed to capture 20-tpd ( tonnes per day) of CO2, and will pave the way for scaling up CO2 capture technology and greening coal power generation.

NTPC is also setting up a green hydrogen generation plant at the same location, which will use Proton Exchange Membrane Electrolysers to produce 2-tpd of hydrogen.

Subsequently, the captured CO2 and green hydrogen will be utilised to produce 10-tpd of green methanol through a heterogeneous catalytic process.

The integrated CO2 to methanol project has been conceived, designed, engineered and awarded by the R&D wing of NTPC – NTPC Energy Technology Research Alliance (NETRA) – and executed by VSTPS

Green Chemical Department in coordination with NETRA.

Chemicals production increased 7.75% till May 2022

Indian Chemical News | 05 September 2022

The quantum of production of major chemicals in India increased to 21.52 lakh tonnes during 2022-23 (up to May, 2022) as compared to 19.97 lakh tonnes during the corresponding period of the previous year, recording an increase of 7.75%.

Production of all major chemicals viz. alkali chemicals, inorganic chemicals, organic chemicals have increased except Pesticides & Insecticides and Dyes & Pigments during the period as compared to the last year. The quantum of production of major Petrochemicals declined to 65.06 lakh tonnes during 2022-23 (Up to May 2022) as compared to 72.20 lakh tonnes during the corresponding period of the previous year, recording a decrease of 9.89%.

Production of the major Petrochemicals i.e. Synthetic Fibre, Performance Plastics and Other Petrochemicals increased, while the production of Fibre Intermediate, Polymers, Synthetic Rubber, Synthetic Detergent Intermediates, Olefins, and Aromatics decreased during the period as compared to the last year.

Major Chemicals valued at Rs. 6,990 crore and major Petrochemicals valued at Rs. 4,372 crore were exported in the month of May, 2022. The import of major Chemicals and major Petrochemicals were to the tune of Rs. 5,151 crore and Rs. 13,537 crore respectively during the month.

The combined exports of major Chemicals and Major Petrochemicals in the year 2022-23 (up to May 2022) has increased to Rs. 22,770 crore from Rs. 20,650 crore. The
imports have increased to Rs. 35,450 crore from Rs. 28,660 crore over the corresponding period of last year.

While exports and imports have both been more than that of the corresponding period of previous year, the increase in imports has been more. There is a trade deficit of Rs. 12,690 crore in the current year in comparison to a trade deficit of Rs. 8,010 crore in the corresponding period of the previous year.

Members’ News

Lords Chloro Alkali and EIL

Indian Chemical News | 05 September 2022

Lords Chloro Alkali Ltd is in the process of expanding its existing caustic soda production capacity approximately by 42% i.e. from 210 Tonnes Per Day (TPD) to 300 TPD at its plant in Alwar, Rajasthan. The commissioning of the aforementioned projects is expected by September, 2023.

Reliance to invest in expanding capacities

Indian Chemical News | 05 September 2022

Reliance Industries Ltd. (RIL) will invest Rs 75,000-crore over the next five years in its oil-to-chemicals (O2C) business and expand capacities in existing and new value chains, Chairman Mr. Mukesh Ambani said at the conglomerate’s 45th Annual General Meeting (AGM) on August 29.

“For our O2C business, this was yet another year of superlative performance. It crossed Rs. 5 lakh crore in annual revenues. The EBITDA crossed Rs 50,000 crore. We are committed to maximise Oil-to-Chemicals integration and convert our advantageous feedstock streams to high-value chemicals and green materials. I am pleased to share that over the next 5 years, we will invest Rs. 75,000-crore and expand capacities in existing and new value chains,” Mr. Ambani said.

The investments will be in three areas: the polyester value chain; the vinyl chain; and in new materials.

In the polyester value chain RIL will build one of the world’s largest single-train purified terephthalic acid (PTA) plant with a capacity of 3-mtpa at Dahej. It will also invest in a 1-mtpa polyethylene terephthalate (PET) plant at Dahej, with both the PTA and PET plants targeted for completion by 2026.

In the vinyl chain, RIL will more than triple its existing capacity by adding world-scale plants at Dahej and Jamnagar in India, and also in the UAE. The conglomerate will aim to complete 1.5-mtpa of feedstock integrated PVC expansion at Dahej and Jamnagar in phases by 2026. It will add capacities to make EDC and PVC at Ruwais, in the UAE, as part of the Ta’ziz Chemical Zone. The joint venture with ADNOC and ADQ will target to meet the full domestic demand of the region. With these expansions, RIL will rank among the Top-5 producers of PVC globally, said Mr. Ambani.

In the area of new materials, RIL will build in phases India’s first and one of the world’s largest carbon fibre plants at Hazira with a capacity of 20,000-tpa, based on acrylonitrile feedstock. It will start acrylonitrile production next year and aim to complete the first phase of the carbon fibre plant in 2025.

NOTIFICATIONS/PRESS RELEASES/MEMORANDA/ORDER

1. Safeguard Initiation Notification 02/2022 dated 16th September 2022 by Ministry of Commerce (DGTR)
   - Safeguard (Quantitative Restrictions) investigation concerning imports of PVC suspension resins with residual VCM above 2ppm

2. Order No. S.O. 4136 (E) to 4141(E) dated 2nd September 2022, by Ministry of Chemicals and Fertilisers, Department of Chemicals and Petrochemicals
   - Extension of enforcement date of Quality Control Orders of 6 Petrochemicals viz. (i) Acrylonitrile Butadiene Styrene (ABS) (ii) Ethylene Dichloride (EDC) (iii) p-Xylene (iv) Polycarbonate (v) Polyurethanes and (vi) Vinyl Chloride Monomer
   https://chemicals.nic.in/sites/default/files/Order_4136-4141.pdf
Everything is new, nothing has changed.

Since 1862, we have advanced industries and societies through our materials technology and never stopped innovating. A journey we have started as Sandvik Materials Technology but will continue as Alleima, with our heritage and values as our travel companions. Our quality stainless steel and alloys remain the same.

Read more at alleima.com
## KEY INDICATORS AUGUST 2022

### 1 Alkali Imports (MT)

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<tbody>
<tr>
<td>Caustic Soda</td>
<td>18,395</td>
<td>24,974</td>
<td>-26.3%</td>
<td>6,563</td>
<td>180.3%</td>
<td>36,347</td>
<td>82,671</td>
<td>-56.0%</td>
<td>2,00,151</td>
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<tr>
<td>Soda Ash</td>
<td>72,026</td>
<td>61,140</td>
<td>17.8%</td>
<td>48,387</td>
<td>48.9%</td>
<td>2,60,847</td>
<td>2,78,676</td>
<td>-6.4%</td>
<td>5,68,929</td>
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<tr>
<td>Sodium Bicarbonate</td>
<td>270</td>
<td>931</td>
<td>-71.0%</td>
<td>820</td>
<td>-67.1%</td>
<td>3,628</td>
<td>8,108</td>
<td>-55.3%</td>
<td>16,403</td>
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Average Price in Jun 2022: Caustic Soda - 629 USD/MT (lye), 579 USD/MT(Flakes) & 738 USD/MT (Solids); Soda Ash - 437 USD/MT; Sodium Bicarbonate - 540 USD/MT

### 2 Foreign Trade - Merchandise (US$ billion)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Aug 2021</th>
<th>% Difference</th>
<th>&quot;FY 2022-23 (upto Aug)&quot;</th>
<th>&quot;FY 2021-22 (upto Aug)&quot;</th>
<th>% Difference</th>
<th>Total Trade 2021-22</th>
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<tbody>
<tr>
<td>Imports</td>
<td>61.9</td>
<td>45.1</td>
<td>37.3%</td>
<td>318.0</td>
<td>218.2</td>
<td>45.7%</td>
<td>613.1</td>
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<tr>
<td>Exports</td>
<td>33.9</td>
<td>33.4</td>
<td>1.6%</td>
<td>193.5</td>
<td>164.4</td>
<td>17.7%</td>
<td>422.0</td>
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<tr>
<td>Surplus/Deficit</td>
<td>-28.0</td>
<td>-11.7</td>
<td>-24.5%</td>
<td>-124.5</td>
<td>-53.8</td>
<td>-124.5%</td>
<td>-191.0</td>
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</table>

### 3 Exchange Rate (Rs./USD)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Jul 2022</th>
<th>Jun 2022</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>79.56</td>
<td>79.60</td>
<td>78.07</td>
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### 4 Index of Industrial Production (Base: 2011-12=100)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Aug 2021</th>
<th>% Difference#</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>131.3</td>
<td>132.4</td>
<td>-0.8%</td>
</tr>
</tbody>
</table>

### 5 Index of Core Industries (Base: 2011-12=100)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Aug 2021</th>
<th>% Difference#</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>138.6</td>
<td>134.2</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

### 6 Index of Industrial Production - Broad Sectors (Base: 2011-12=100)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Aug 2021</th>
<th>% Difference#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>99.6</td>
<td>103.6</td>
<td>-3.9%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>131.0</td>
<td>131.9</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Electricity</td>
<td>191.3</td>
<td>188.7</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

### 7 Index of Industrial Production - Manufacturing Sub-groups (Base: 2011-12=100)

<table>
<thead>
<tr>
<th>Sub-Groups</th>
<th>Aug 2022</th>
<th>Aug 2021</th>
<th>% Difference#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical &amp; Chemical Products</td>
<td>131.4</td>
<td>124.8</td>
<td>5.3%</td>
</tr>
<tr>
<td>Textiles</td>
<td>105.5</td>
<td>120.2</td>
<td>-12.2%</td>
</tr>
<tr>
<td>Paper &amp; Paper Products</td>
<td>83.1</td>
<td>82.8</td>
<td>0.4%</td>
</tr>
<tr>
<td>Basic Metals</td>
<td>184.0</td>
<td>178.8</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

### 8 Index of Industrial Production Country-wise Comparisons (Base: 2015=100)

<table>
<thead>
<tr>
<th>Country</th>
<th>Aug 2022</th>
<th>Aug 2021</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>118.3</td>
<td>119.6</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Russia</td>
<td>NA</td>
<td>115.8</td>
<td>-</td>
</tr>
<tr>
<td>Brazil</td>
<td>NA</td>
<td>93.6</td>
<td>-</td>
</tr>
<tr>
<td>European Union (27)</td>
<td>109.6</td>
<td>105.6</td>
<td>3.8%</td>
</tr>
<tr>
<td>USA</td>
<td>103.8</td>
<td>100.0</td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>102.7</td>
<td>95.6</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

# The growth rates over corresponding period of previous year are to be interpreted considering the unusual circumstances on account of Covid-19 since March 2020.

### 9 All India Inflation Rates (Base: 2012=100)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Aug 2021</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>174.3</td>
<td>162.9</td>
<td>7.0%</td>
</tr>
</tbody>
</table>

### 10 Consumer Price Inflation - Industrial Workers (Base: 2016=100)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Aug 2021</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>130.2</td>
<td>123.0</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

### 11 Foreign Investment Inflows (US$ Million)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Jul 2022</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Foreign Direct Investment</td>
<td>305</td>
<td>5,385</td>
<td>-94.3%</td>
</tr>
<tr>
<td>Net Portfolio Investment</td>
<td>7,446</td>
<td>362</td>
<td>1956.9%</td>
</tr>
<tr>
<td>Total</td>
<td>7,751</td>
<td>5,747</td>
<td>34.9%</td>
</tr>
</tbody>
</table>

### 12 Foreign Investment Promotion Board (FIPB) Approvals (US$ Million)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Jul 2022</th>
<th>Jun 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27</td>
<td>60</td>
<td>113</td>
</tr>
</tbody>
</table>

### 13 Foreign Exchange Reserves (US$ billion)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Jul 2022</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aug 2022 (as on 26 Aug 2022)</em></td>
<td>561</td>
<td>574</td>
<td>-2.2%</td>
</tr>
<tr>
<td><em>Jul 2022 (as on 29 Jul 2022)</em></td>
<td>561</td>
<td>574</td>
<td>-2.2%</td>
</tr>
</tbody>
</table>

### 14 Fiscal Deficit (Mar 2020-Apr 2021)

<table>
<thead>
<tr>
<th></th>
<th>% of Actuals to Budget Estimates FY 2022-23</th>
<th>% of Actuals to Budget Estimates FY 2021-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>% actuals</td>
<td>32.6%</td>
<td>31.1%</td>
</tr>
</tbody>
</table>

The fiscal deficit for FY22 is 6.7 % of GDP, lower than revised estimate of 6.9 %.

### 15 Purchasing Managers Index (PMI)

<table>
<thead>
<tr>
<th></th>
<th>Aug 2022</th>
<th>Jul 2022</th>
<th>Jun 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>56.2</td>
<td>56.4</td>
<td>53.9</td>
</tr>
</tbody>
</table>

Index over 50 shows expansion, while below 50 means contraction

Data Source: GOI, OECD, IHS & AMAI Research
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<table>
<thead>
<tr>
<th>Water Capacity (Ltr)</th>
<th>42</th>
<th>84</th>
<th>100</th>
<th>118</th>
<th>780</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Capacity (Kg) Ammonia</td>
<td>21</td>
<td>42</td>
<td>50</td>
<td>60</td>
<td>398</td>
</tr>
<tr>
<td>Gas Capacity (Kg) Chlorine</td>
<td>50</td>
<td>100</td>
<td>119</td>
<td>140</td>
<td>930</td>
</tr>
<tr>
<td>Tare Weight (Kg) Approx</td>
<td>43</td>
<td>62</td>
<td>71</td>
<td>82</td>
<td>628</td>
</tr>
</tbody>
</table>

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- Candles & Registers in PP or PVDF
- Seamless Filter Hose as filtration media (Indigenously available)
- Vessel hard rubber lined from inside
- Direct filtration eliminates clarifier and gives clarity below 0.3 ppm
- Spare parts available ex-stock at a very economical pricing
- Dry discharge or Slurry discharge possible
- Reduced investment cost

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- Grasim Industries, Ganjam
- Gharda Chemicals, Lote
- Koruma Tarim, Turkey
- TGV SRAAC Ltd., Kurnool (Formerly, Rayalseema Alkalies)
- Punjab Alkalies & Chemicals Ltd., Chandigarh
- Atul Industries, Gujarat

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website: www.ama-india.org