SULPHATE REMOVAL AND CONCENTRATION SYSTEM (SRCS)

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 (Feed)</td>
<td>10 ± 2 g/l</td>
</tr>
<tr>
<td>Permeate Low Sulfate Salt Brine (Permeate)</td>
<td>1.5 ± 0.5 g/l</td>
</tr>
<tr>
<td>Concentrated High Sulfate Brine (Reject)</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

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.
NEW SANICRO® 35
BRIDGING THE GAPS TO NEW OPPORTUNITIES

Sanicro® 35 is the latest grade addition to our growing portfolio of nickel alloys and austenitic stainless steels. This super-austenitic grade is unique because it bridges the performance gaps between stainless steels and higher cost nickel alloys. It’s precisely this “no compromises” thinking that led a NACE jury to nominate Sanicro® 35 as best new material for 2021. From hydraulic and instrumentation tubing to heat exchangers, Sanicro® 35 minimizes risk and extends production lifecycles in demanding environments.

For further enquiries, please email our APAC Business Development Manager vikram.pandit@sandvik.com
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**Members’ News**

Meghmani Finechem eyeing Rs. 5,000 crore revenue by FY27

Andhra Chief Minister inaugurates Grasim’s chlor-alkali plant

CM Jagan invites Aditya Birla to be Ambassador of AP

Grasim Industries Ranked India’s Most Sustainable Company

GACL-NALCO JV commissions new chlor-alkali plant at Dahej

GHCL is coming up with a Greenfield project in Soda Ash; Rs 3,500 crore will be invested over the next three years: Ravi S Jalan, MD

**NOTIFICATIONS/PRESS RELEASES/ MEMORANDA**

1. DGFT Helpdesk support now available on 24x7 basis- reg - 22/04/2022

2. Industry facilitation cell at DCPC, Government of India – 14/04/2022

3. Online monitoring of pollution by industries – Parliament Q&A. – 04/04/2022

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BICHLOR™ electrolysers deliver superior energy performance.

- Very low power consumption of less than 1990* kWh/te NaOH @ 6 kA/m² delivers significant energy savings
- Class leading output of 69,000 MTPA NaOH per electrolyser**
- Robust, safe construction with superior strength and resistance to damage and distortion
- Largest effective working area of 3.4m² per module means fewer modules are required per tonne of NaOH
- Support from our global network of expert, specialist teams

Designed for life.

Learn more at www.ineos.com/electrochemical

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

The industry lost a luminary in the passing away of Mr. N. Sankar, Chairman of Sanmar Group in Chennai on 17th April 2022. The Sanmar Group, with diversified business interests, including in PVC, Chemicals (Caustic Soda, etc.), Engineering, Shipping, etc. grew in stature and business under his stewardship. Mr. Sankar was considered a trendsetter for the industry, having adopted people-centric management practices based on ethics and trust. He was a pioneer in PVC production and had set up integrated manufacturing facilities. He also expanded the Group’s international footprint with investments in Egypt, the US, and other countries. Mr. Sankar’s keen business acumen stood out. He also left his imprint as a philanthropist and a patron of sports.

AMAI deeply condoles the passing away of Mr. Sankar and pays homage to the departed soul.

Soon after India signed the Comprehensive Economic Partnership Agreement (CEPA) with the UAE, the government announced the signing of the India-Australia Economic Cooperation and Trade Agreement (Ind-Aus ECTA) early this month. This is an interim agreement that provides duty free access to 100% of tariff lines from India to the Australian market and on 85% of products from Australia to India. The ECTA aims to the bilateral trade of goods and services to $50 billion in five years and to $100 billion by 2030 from the current level of $27.5 billion. The government is also aggressively pushing for trade agreements with the UK, Canada, the EU and Israel.

The present government in its first term (2014-19) took a very cautious approach to signing trade agreements, especially after the trade agreements signed in earlier years were found to have benefitted our trade partners more than India. Some experts have said that our exporters have not taken advantage of the opportunities offered by trade agreements, resulting in a skewed growth in favour of trade partners. The government has embarked on sensitizing the industry on the opportunities from trade agreements while also engaging with trade and industry through extensive consultations before signing trade deals.

India’s merchandise exports touched a record $420 billion in 2021-22, exceeding the government’s target of $400 billion by 5%. Chemicals exports rose sharply by 106% to $29.3 billion during the year. An increase in volume together with higher realization have made this possible. Government support schemes like the Production Linked Incentive (PLI) Scheme and the Make in India Programme have also aided the growth in exports. The government has set an ambitious target of $450-480 billion in merchandise exports in 2022-23. A balanced approach to trade agreements along with inclusion of more sectors for benefits under PLI and RoDTEP can make this target more easily achievable.

K. Srinivasan
Secretary General
Enable Unified Contextual Insights and Improve Batch Accuracy Rate by 5X
According to the impact study of NACE (AMPP) the global cost of corrosion is 2.5 trillion USD. This accounts for 3% of the annual GDP of the globe. NACE also explained that by using best practices 15 to 35% of the cost i.e., 350-800 Billion USD can be saved. Apart from the huge cost of corrosion there is always a risk of human lives as well.

Sandvik Materials Technology is committed to fight against corrosion through the development of various corrosion resistant alloys. With a rich history of over 160+ years of innovation and expertise, they have been at the helm of the Corrosion Resistant Grades globally. With its expanding base in India, Sandvik is producing high-end corrosion resistant alloys in tubular form for various segments like Refinery, Petro-chemicals, Chloro-Alkali etc.

With its R&D and Technical Marketing set-up, Sandvik is enhancing its service levels with the end-users in Material Selection, Failure Analysis etc. Sandvik is geared up to ensure end-to-end solution for its clients to improve their productivity and reliability.

At the webinar conducted by AMAI in association with Sandvik, the teams shared their expert corrosion knowledge useful to this segment including other crucial aspects such as failure analysis, lifecycle improvement for equipment, materials selection, products on offer and solutions. It further included knowledge sharing over the grades, alloy development, tube technology, besides safety and reliability of their products.

The products on offer at Sandvik Materials Technology are consistent in quality, have high corrosion resistance along with tight dimensional tolerances, ovality, eccentricity and controlled hardness. They even have tighter internal specification compared to the industry standard with excellent bendability. With suitability for all types of heat exchangers, it has lower life-cycle costs, higher mechanical strength and good weld ability, all of which are relevant to the Chlor-Alkali industry.

The webinar covered different types of Corrosion, associated Case Studies, available Tube Technology, Technical Specifications, followed by Q&A by technical experts from their teams.

The webinar was presented by Mr. Vikram Pandit, Technical Marketing Manager, APAC. He spoke about the Stainless-Steel History & its Evolution followed by the basics of Corrosion & its types. The session also covered some of the interesting Failure Case Studies from the Industry. The audience very much appreciated the case stories from the field. The case stories covered wide range of corrosion issues like Pitting Corrosion, Crevice Corrosion, Stress corrosion

Failure case study of Cu-Ni Alloys
general and pitting corrosion, and avoid crevice corrosion.

Its versatile material properties mean it offers clever risk reduction, providing customers with a smart and cost-efficient choice for dealing with corrosion. By bridging the gap between stainless and nickel alloys, Sanicro® 35 is able to deliver an optimized price-performance ratio and the ability to balance out heat exchanger performance fluctuations.

Sanicro® 35 has the ability to generate confidence in material selection and to reduces traditional over-conservatism through the delivery of performance capabilities appropriate to the demands of the job. In a cost-conscious environment, Sanicro® 35 can be considered an all-round tube solution to many H&I and HX challenges.

The second half of the talk was on the Tube Technology.

Sandvik is a global leader when it comes to the manufacturing of high end alloys for highly corrosive media. Sandvik has an in-house melting shop where the raw material for the tubes is manufactured, giving it a complete control on the properties of the tube heat after heat, lot after lot.

The global standard of tube manufacturing is Extrusion followed by Cold-pilgering or drawing. It not only ensures good quality material but
**Introduction**

Valve corrosion is commonly viewed as damage to the metal material of the valve under the effect of a chemical or electrochemical environment. Since the “corrosion” occurs in the spontaneous reaction between the metal and the surrounding environment, the prevention of corrosion focuses on how to separate the metal from the surrounding environment or use more non-metallic synthetic materials. Valve corrosion is a huge problem in many industries around the world especially in the chemical, oil and gas industry. Due to the use of dissimilar metals in valves, these can react when in contact with moisture but this can be exacerbated with seawater and subsequently they leak and fail due to Galvanic Corrosion. Some locations are more prone by corrosion than others. This may be because they are closer to the sea. But a harsh environment is not a requirement for valves to start corroding; the most common type of corrosion is in fact galvanic. Valve leakages and failures come at a significant cost.

Another important reason for corrosion in a valve is when the metal has broken down or has been damaged through chemical reactions. The corrosion we are familiar with is that which affects metals; the presence of oxygen in the air, with a bit of added moisture, is enough for something that is made from steel to begin the corrosion process, most of the time this is accelerated by other environmental factors. The principle of valve corrosion mainly comprises of: 1) chemical corrosion and 2) electrochemical corrosion.

**Chemical corrosion:**

Under the condition of no electric current, the surrounding medium acts directly with the valve metal and destroys it, such as high temperature dry gas and non electrolyte solutions.

**Electrochemical corrosion:**

The main form of corrosion is that the valve metal contacts the electrolyte and produces a flow of electrons that destroys itself in electrochemical action. This corrosion of common alkali-acid-salt solution, atmospheric corrosion, soil corrosion, seawater corrosion, microbial corrosion, pitting corrosion and crevice corrosion of stainless steel are all electrochemical corrosion. Electrochemical corrosion occurs not only between two substances that can act chemically, but also because of the difference in the concentration of solution, the concentration of oxygen around it, the slight difference in the structure of the substances, and so on.

**Measures for protection of valve corrosion:**

There are mainly ten methods for protecting valves from getting corroded namely: 1) electrochemical protection; 2) use of nonmetallic materials; 3) metal surface treatments; 4) choosing corrosion resistant materials according to the corrosive medium; 5) spray coating of valve surface; 6) addition of corrosion inhibitors; 7) thermal spraying of valve metal surface; 8) controlling corrosive environment; 9) improving the valve structure; 10) selection of proper packing material, and 11) ensuring proper design, operation and maintenance of valves.

**Electrochemical Protection:**

Both anodic and cathodic protection provides electrochemical protection. The so-called anodic protection is to add an external direct current to protect the metal so that the potential for the anode increases in a positive direction. When raised to a certain point, a dense protective film is created on the metal anode surface, which is a passivation film. Metal cathode corrosion is reduced significantly.

Cathodic protection means the protected metal is being used as a cathode, and a direct current is applied in a negative direction to lower the potential. When a certain potential value is reached, the corrosion current speed is decreased, and the metal is protected. Additionally, metal to be protected can be protected by cathodic protection with a metal having a higher electrode potential than the protected metal. For example, zinc is corroded, and is considered sacrificial metal if it is used to preserve iron. This cathodic protection method is used by large-scale valves and essential valves, which is an economical, simple, and effective process.

**Use non-metallic material:**

Corrosion resistance of non-metallic
material is good as long as the valve temperature and pressure match non-metallic material specifications. It will not only solve the corrosion issue but also save precious metals. The valve body, valve cover, lining, sealing surface and the rest are usually made from non-metallic materials. The filler for the gasket is made primarily of non-metallic materials. The valve is coated with plastics such as polytetrafluoroethylene (PTFE) or chlorinated polyether, and rubber (like natural rubber, neoprene, or nitrile). The valve body and cover are made of standard cast iron and carbon steel. Nowadays, plastics like nylon and polytetrafluoroethylene (PTFE) are more commonly used and different sealing surfaces are made of natural and synthetic rubbers. Sealing rings are used for different valve types. These non-metal materials used as sealing surfaces not only have good resistance to corrosion but also good sealing efficiency and are especially suitable for use in granular media.

Of course, their strength and thermal resistance are poor and the range of applications is small. Flexible graphite has allowed non-metals to reach the high-temperature markets, solving the long-term problems of filler and gasket leakages, and it is also a good high-temperature lubricant.

Metal surface treatment:

Metal surface treatment processes include plating, surface penetration, passivation of surface oxidation, etc. Its aim is to improve the resistance of metals to corrosion and improve the mechanical energy of metals. Surface treatments are commonly used for increasing the life of valves. Particularly the problem of valve stem corrosion is avoided by applying anti-corrosion surface treatments. Surface treatment methods such as nitriding, boronizing, chrome plating, and nickel plating, are generally used to enhance corrosion resistance, erosion resistance, and resistance to abrasion of valves. Different surface treatment will be suitable for various valve stem materials and working environments. Valve stems in contact with air, water vapor medium, and asbestos packaging may be hard chrome-plated and gas nitrided. The small-diameter valve bodies and hand wheels are also often chrome-plated to enhance their corrosion resistance and decorate the valve.

Choose corrosion-resistant materials:

The corrosion of the material is quite complicated in actual processes. Even if we’re using valve material for the same medium, the strength, temperature, and pressure of the liquid will be different and consequently the corrosiveness of the medium to the substrate will be different. For example, the rate of corrosion increases by around 1 to 3 times for every 10°C rise in the temperature of the environment/medium. The environment consists of the entire surrounding in contact with the valve material. The primary factors to describe the environment are namely: a) physical state- gas, liquid, or solid; b) chemical composition-constituents and concentrations; and c) temperature. Other factors can be important in specific cases. Examples of these factors are the relative velocity of a solution (because of flow or agitation) and mechanical loads on the valve material, including residual stress within the material. The primary factors are: nature of corrodents, operating conditions, and polarization effects caused by the environment. The secondary factors or physical conditions affecting corrosion are: valve design, stress to which the valve material is subjected, nature of couples present in the medium, presence of external energy, and mechanical actions of the medium/environment, etc.

It is useful to identify both natural combinations and unnatural combinations of metal and environment in corrosion of valves. Examples of natural or desirable combinations of material and environment include nickel in caustic environments, lead in water, and aluminium in atmospheric exposures. In these environments, the interaction between the metal and the environment does not usually result in detrimental or costly corrosion problems.

In alloy selection for valve material, there are several ‘natural’ metal-corrosive combinations. These combinations of metal and corrosive usually represent the maximum amount of corrosion resistance for the least amount of money. Some of these natural combinations are listed below:

- Stainless steels- nitric acid.
- Nickel and nickel alloys- caustic, reducing/non-oxidizing environments.
- Monel- hydrochloric acid.
- Hastelloy (Chlorimets)- hot hydrochloric acid.
- Lead- dilute sulphuric acid.
- Aluminum- nonstaining atmospheric exposure.
- Tin- distilled water.
- Titanium- hot strong oxidizing solutions.
- Tantalum- ultimate resistance.
- Steel- concentrated sulphuric acid.
- Chromium containing alloys- oxidizing solutions.
- Copper and alloys-reducing and non-oxidizing environments.

Unnatural combinations, on the other hand, are those that result in severe corrosion damage to the valve metal because of exposure to an undesirable environment. Examples of unnatural combinations include copper in ammonia solutions, stainless steel in chloride-containing environments (e.g. seawater), and lead with wine, etc.

The affect of concentration of the medium is another very important
criterion for selection of valve material. For example, stainless steel is very resistant to dilute nitric acid, but corrosion is more severe in more than 95% of concentrated nitric acid. The guide line for proper selection of valve material for some specific environments is given below:

**Sulfuric acid medium:**

The corrosion resistance of carbon steel and cast iron is better when the concentration of sulfuric acid is above 80% and the temperature is below 80. But carbon steel and cast iron are not suitable for high flow rates of sulfuric acid. Ordinary stainless steel, such as 304, 316 on sulfuric acid medium have limited use. So the selection of sulfuric acid pump valve usually uses high silicon cast iron or high alloy stainless steel (No 20 alloy). Fluoro-plastics has good resistance to sulfuric acid and is a more economical choice to use in pump valves. But, if the pressure is too large, temperature rises impacting the plastic valves. Thus a more expensive ceramic ball valve should be chosen.

**Hydrochloric acid medium:**

Most of the valve metals are not resistant to hydrochloric acid. High ferrosilicon containing molybdenum can be used at 60 and up to 30% concentration. However, most nonmetallic materials have good corrosion resistance to hydrochloric acid. Therefore, lined rubber and plastic coated valves (polypropylene, fluoro-plastics) are the best choice. If the temperature exceeds 150 or the pressure is greater than 16 kg/cm², any plastic material will not be suitable.

**Nitric acid medium:**

Most metals are destroyed in nitric acid by rapid corrosion. Stainless steel is the most widely used valve material in nitric acid application. It has good resistance to nitric acid at all concentrations at room temperature. It is worth mentioning that corrosion resistance of stainless steel containing molybdenum such as 316 and 316L to nitric acid is not as good as common stainless steel such as 304 or 321. For high temperature application however, titanium and its alloys should be used.

**Chlorine (gas and liquid) medium:**

The resistance of most metal valves to chlorine corrosion is limited, especially in the case of chlorine with water. Teflon valves are a good choice but it may have ageing affect with long duration of use. Therefore Teflon ceramic ball core valves will be better for very critical valves. The self lubricating property and corrosion resistance of Teflon and ceramic respectively help increase life of these valves.

**Amonia (Amonium hydroxide) medium:**

Most metal and non-metal corrosion in liquid ammonia and ammonium hydroxide are very mild. Only copper and copper alloys are not suitable for applications in ammonia.

It can be seen from the examples above that the right selection of valve materials will be based on particular conditions. Various corrosion factors should be evaluated and valve materials should be chosen according to the application.

**Spray coating:**

Paint coating is the most commonly used anti-corrosion process and is an important tool for identification of valve products. Coatings are mostly non-metallic in nature. They are typically made of synthetic resin, rubber slurry, vegetable oil, solvent, etc., covering the metal surface, isolating the material, and the environment for anti-corrosion purposes. Coatings are primarily used in conditions where corrosion is not serious, such as water, salt water, seawater, or atmospheric.

The interior of the valve is normally coated with anti-corrosive paint to prevent water, air, and other media from corroding the valve. The paint is combined with a variety of colours to reflect the materials used by the valve manufacturers. The valves can generally be coated or painted in half a year or once a year frequency.

**Add corrosion inhibitor:**

The addition of other special substances to corrosive media and corrosives will significantly slow down the rate of metal corrosion. This unique material is known as a corrosion inhibitor. Corrosion inhibitors are commonly used for media and packaging. The addition of a corrosion inhibitor to the medium can slow down the corrosion of equipment and valves. For example, in the oxygen-free sulphuric acid, chrome-nickel stainless steel corrosion is very dangerous. However, if a small quantity of oxidants is applied, such as copper sulphate or nitric acid, the stainless steel may be converted into a passive state and a protective coating is formed on the surface to avoid the etching of the material. The valve pressure test generally uses water as a pressure test medium, which can easily cause valve corrosion. Adding a small amount of sodium nitrite to water will prevent the valve from being corroded by the water. The asbestos filler contains chloride, which is highly corrosive to the stem of the valve. The corrosion inhibitor is composed of sodium nitrite and sodium chromate to form a passivation film on the valve stem's surface to improve the valve stem's corrosion resistance. The solvent can slowly dissolve the corrosion inhibitor and may provide lubrication for the valve stem.

There are chlorides in the asbestos packing, which corrodes the valve rod greatly. Therefore, washing of
valve rod with distilled water can reduce the chloride content. Zinc powder can be applied to asbestos packing and valve stem as sacrificial metal to cathodically protect the valve stem from corrosion. Zinc powder combines with chloride in asbestos, significantly decreasing the risk of interaction between chloride and stem metal, thereby serving anti-corrosion purposes. If the coating is reinforced / sprayed with corrosion inhibitors such as lead or calcium, the valve surface can be prevented from atmospheric corrosion.

**Thermal spraying**

It is a form of process for coating preparation and has become one of the latest material surface protection technologies. It uses a heat source of high energy density (gas combustion flame, flare, plasma arc, electric arc, gas explosion, etc.) to blast and melt the metal or non-metal substance and then spray it onto the pre-treated basic surface in an atomized form to form a sprayed sheet, or at the same time heat the base surface to re-melt the coating on the surface of the substrate to form a spray-welded sheet. Most metals and their alloys, metal oxide ceramics, metal ceramic composites, and hard metal compounds may be sprayed onto a metal or non-metal substrate by one or more thermal spraying methods.

Thermal spraying will increase the resistance of the surface to corrosion, wear, high-temperature, and impart other properties extending the service life. Special thermal spray coatings have unique properties such as heat insulation, isolation (or iso-electric), sealing, self-lubrication, heat emission, electromagnetic shielding, etc. Thermal spraying can also be used to repair valve parts.

**Control the corrosive environment:**

There are broad and narrow senses about the so-called environment.

In a general sense, it refers to the atmosphere around the installation of the valve and its medium of internal circulation; in a narrow sense, the environment refers to the conditions around the installation of the valve. Most conditions are uncontrollable. The method of regulating the atmosphere, such as boiler water de-oxidation and the pH of the alkali in the refining process, may only be used when there is no damage to the product or process. The addition of corrosion inhibitors, electrochemical safety, etc. also helps in controlling corrosive environments. The environment is generally full of dust, smoke, and water vapours causing varying degrees of corrosion on the valve. The operator should periodically clean and purge the valve and carryout re-lubrication regularly. This is an important measure for managing corrosion inside the system. The valve stem is mounted with a protective cover, the ground valve is fitted with a well, and the valve surface is coated with resin, to avoid corrosion. Increased ambient temperatures and air pollution can accelerate corrosion, especially in closed environments. Hence proper care should be taken to reduce atmospheric corrosion.

**Improve processing technology and valve structure:**

The valve’s anti-corrosion safety is a concern that has to be considered from the start of the design. Without question, a valve product with a fair structural design and proper manufacturing process would have a positive impact on reducing valve corrosion.

**Packing selection**

There are many suppliers who supply seals and packing to the valve manufacturers. Packing is made all around the world, but not all packing is the same. There are packings that meet a commercial requirement and some that meet regulatory specification like ISO, API, etc. The main difference is what they contain within the material. The cheaper the seals/packings the more impurities are likely to be in the material and therefore they have a greater risk of galvanic corrosion and possibly causing premature valve failures. In the compression packing industry, galvanic corrosion is commonly encountered when a valve is packed with a carbon and/or graphite packing set. Without corrosion inhibitors, the stem becomes an anode and may get corroded at a faster rate.

**Proper design, operation and maintenance:**

The following precautions should be taken to prevent rapid valve corrosion:

- Spot and lap welding of valve parts should be avoided. Only double sided continuous butt welding will prevent rapid corrosion in valves.
- The gap at the valve joints can cause rapid corrosion due to differential oxygen concentration. Therefore, the gap between stem and closing piece should be avoided by proper screw connection.
- Polytetrafluoroethylene (PTFE) should be preferably used for valve thread connection as it has good corrosion resistance and is a good sealant.
- Valve structure should not have dents for avoiding stress corrosion cracking and the valve discharge hole should be free from deposits and burrs.
- Proper surface finish of the valve components particularly the stem should be ensured while manufacturing the valves.
- Proper materials for packing and gaskets should be selected for avoiding stem and flange sealing/seating corrosion.
• The valves should be properly heat treated after fabrication and machining for avoiding electrochemical corrosion.
• Direct bimetallic and multi-metallic contact having large difference in their electrochemical potential should be avoided for preventing galvanic corrosion.
• Valves should be properly stored in the warehouse with proper preservatives and packing to avoid atmospheric corrosion and water ingress into the valve components.
• The stem of the valve may be chrome, nickel or zinc plated depending upon the operating medium. In addition, nitriding or boronizing may also help in reducing rapid corrosion.
• The chloride content of the asbestos packing should be washed out with distilled water. In addition, sodium nitride (corrosion inhibitor) may be added to asbestos packing for avoiding pitting of the valve stem.
• Use of PTFE as packing material at the joints of closing piece and the seal face should be preferred for corrosion prevention provided the fluid operating temperature is below 200°C.

Conclusion:
Corrosion of valves in a process industry is caused by chemical and electrochemical reactions. Chemical Corrosion is caused by the direct action of surrounding medium with the valve metal, such as: high temperature dry gas and non electrolyte solutions, etc. Electrochemical corrosion of valves is caused by combination of different valve metals having different electrochemical potentials (anodes and cathodes), in contact in the presence of an electrolyte (moisture/water, acid-alkali-salt solutions, sea water, atmosphere and ambient conditions, presence of salt, soil, microorganisms, etc). Presence of certain impurities in the medium, such as chlorides, solid particles, etc., accelerates electrochemical corrosion of stainless steel valves, by pitting corrosion and crevice corrosion.

It is extremely necessary and important to prevent rapid corrosion of valves in a process plant/industry in order to keep the process parameters in control and in optimum condition, and keep the plant premises in safe condition by avoiding leakages through the valves. There can be loss of product quality and quantity affecting the productivity of the process plant due to valve corrosion.

The failures of valves by corrosion can be prevented by providing electrochemical protection; use of non-metallic materials; providing adequate coatings and surface treatments; selecting corrosion resistance valve materials with respect to the corrosives (type of medium); altering the corrosive medium and using corrosion inhibitors; selecting adequate packing materials; ensuring proper fabrication and manufacturing (machining) of valves; and ensuring proper design, operation and maintenance of valves.
CAUSTIC SODA
Identification
Caustic Soda CAS Number:
CAS 1310-73-2.
Caustic Soda UN Number
UN 1823/1824
Caustic Soda Hazard Class:
Corrosive     Class 8
Hazards associated with Caustic Soda
Persons engaged for cleanup should
be trained and should be informed
about hazards associated with caustic soda.
Caustic soda is a strong alkali and
it reacts with various acids, such
as hydrochloric acid and generates
considerable exothermic heat of neutralization
Persons should avoid skin and eye
contact with caustic soda as it is
corrosive to skin and eyes.
Caustic Soda is Corrosive to skin. It
may cause skin burns. Contact with
skin will result in severe irritation.
Caustic Soda is Corrosive to eyes. It is
a severe eye irritant. Contact of eye
with caustic Soda can cause corneal
burns. Contamination of eyes with
caustic Soda can result in permanent
eye injury.
Breathing in mists or aerosols of
caucistic Soda may produce respiratory
irritation.
Personal Protective Equipment
(PPEs)
Persons engaged for Sodium
hydroxide spill cleanup activity should
wear proper personal protective
equipment
Persons working with caustic Soda
should Wear protective clothing (suits,
gloves, foot wear, and head gear). These PPEs should be clean.
Persons working with caustic soda
should wear Suitable close-fitting
goggles with side shields to protect
their Eye and face from contact with
caustic soda.
Persons working with caustic soda
should wear Broad-brimmed alkali-
resistant plastic or rubber hats to
provide protection for head, face and
neck from splashing of caustic soda.
Persons working with caustic soda
should wear Non-slippery rubber gum
boots or rubber-coated canvas boots
and Rubber apron for their Foot and
leg Protection
Persons working with caustic soda
should wear Rubber or PVC gloves
for the hands with protection up to
elbow.
Persons working with caustic soda
should wear Suitable respirators or
protective hoods when handling
flakes, granules or powdered caustic
soda.
Clean up of Caustic Soda Spill
Evacuate all personnel from the
affected area. Secure and control
entrance to the caustic soda spilled
area. Eliminate all sources of ignition
Caustic Soda Solid spill
Recover the spilled caustic soda flake
or solid as soon as possible. Collect
solid material in most convenient and
safe manner and place into sealed
containers for disposal.
Caustic Soda Liquid spill
In the case of spillage of a large
quantity of caustic soda liquid, put
together it at once in a ditch or pit
and recover it from the pit and store
in sealed containers for disposal or
recovery.
If this is not possible to collect the
spilled caustic soda liquid, surround
the spilled caustic with sand or other
materials to prevent it from flowing
out.Absorb the liquid in dry sand,
earth or similar material and place
into sealed containers for disposal
In the case of a small quantity of
spilled liquid caustic, wipe it off, and
sprinkle a large quantity of sodium
bicarbonate over it so that no caustic
soda remains
Do not use water or any wet method.
Do not wash into sewer.
Contaminated soil
Remediation
In case of spillage of caustic Soda
liquid, the floor should be washed
with water from a hose after collecting
the spilled caustic soda. The washings
should be collected and stored in
an impervious container for disposal
since the wash water is of high pH
and it is harmful to aquatic life if
disposed in water body.
Ventilate and wash area after cleanup
is complete
Waste Disposal
Sodium hydroxide collected has to
be disposed as hazardous waste after
proper neutralization with an acid. The neutralized waste may be sent to an effluent treatment plant for treatment and disposal.

The discharged water used for washing must be neutralized before it is drained out or sent for treatment in a common effluent treatment plant.

All applicable rules and regulations for waste disposal should be ascertained and observed.

**HYDROCHLORIC ACID**

**Identification**

**Hydrochloric Acid, CAS number:** CAS 7647-01-0

**Hydrochloric Acid, UN Number:** UN1789

**Hazard Class:** corrosive materials

**Hazards associated with Hydrochloric Acid**

Persons engaged for cleanup should be trained and should be informed about hazards associated with Hydrochloric Acid.

Hydrochloric Acid is a strong acid and it reacts with various Alkalies, such as caustic Soda and generates considerable exothermic heat of neutralization.

Hydrochloric acid is corrosive to the eyes, skin, and mucous membranes. Short term inhalation may cause eye, nose, and respiratory tract irritation and inflammation. Short term oral exposure may cause corrosion of the mucous membranes, oesophagus, and stomach. Skin contact may produce severe burns, ulceration, and scarring in humans.

Contact of the eyes with aqueous hydrochloric acid causes severe irritation of the eyes and eyelids. If the acid is not quickly removed thorough irrigation with water, there may be prolonged or permanent visual impairment or total loss of sight.

On contact with the skin, Hydrochloric acid cause severe burns unless promptly washed off.

Inhalation of excessive concentrations of hydrochloric acid vapours produces severe irritation of the upper respiratory tract, resulting in cough, burning of the throat, and a choking sensation.

**Personal Protective Equipments (PPES)**

Suitable gas-tight chemical safety goggles recommended for Eye protection.

Safety hats, or hard hats made of treated fibre or Brimmed felt hats recommended for head protection for use in hydrochloric Acid spill clean-up activities.

High rubber shoes with built-in steel toe-caps are recommended for Foot and leg Protection of persons handling concentrated aqueous hydrochloric acid.

Rubber or synthetic plastic aprons should be used for protection of body skin against accidental contact with Hydrochloric Acid.

Rubber gloves should be worn to protect the hands from contact with Hydrochloric Acid.

The previously used rubber aprons and hand gloves should be washed to remove hydrochloric acid from these PPEs.

**Clean up of Hydrochloric Acid spill.**

Spills of aqueous Hydrochloric acid solution need to be handled as quickly as possible. Otherwise it will have significant contamination of the environment and adverse health effect on human beings.

Immediate objective is to prevent spilled liquid hydrochloric acid to seep into sewers and surface water bodies and ground water.

Erect dikes, bunds around the spilled area, contain the acid and collect the spilled acid in sealed container for disposal. The spilled acid should not be washed with water as it will seep into underground and nearby water bodies. The Water may be sprayed on the Hydrochloric Acid vapour for dispersal.

Soda ash or lime should be available for immediately neutralizing spilled acid on concrete, wood, or other reactive or absorbing material. When soda ash is used, ample ventilation should be provided.

**Contaminated soil Remediation**

After recovering spilled aqueous hydrochloric acid, the affected soil in the spilled area has to be excavated. Contaminated soil need to be removed because the acid soaked in the soil will leach to ground water or surface water during rain. The acid soaked soil will also affect human beings and animals while crossing over the spilled area.

The soil is to be excavated to a depth till which the acid has seeped into the ground depending on the quantity of acid spilled.

For removal of contaminated soils, the standard practice is to excavate visible contamination, screen the contaminated site for hotspots using PH Paper strips as an indication of contamination (PH<6). Soils to be excavated, till no acid contamination is found. In case of very large spillage grab samples of soil need to be collected and tested for chloride ions for confirmation. Chloride content<1000mg /KG is acceptable level of cleanup of the area.

Contaminated soil should be stored in covered containers for disposal.
**Waste Disposal**

Contaminated soil stored in covered containers should be disposed as hazardous waste.

The recovered acid stored in covered containers should be disposed as hazardous waste after proper neutralization. The recovered acid should be neutralised with an alkaline material such as Lime, soda ash or caustic soda. The neutralised acid is sent to an effluent treatment plant for treatment and disposal.

All applicable rules and regulations for waste disposal should be ascertained and observed

**SODIUM HYPOCHLORITE**

**Identification**

Sodium Hypochlorite CAS Number: CAS 7681-52-9.

Sodium Hypochlorite UN Number: UN 1791

Sodium Hypochlorite Hazard Class: Corrosive Class 8

**Hazards associated with Sodium Hypochlorite**

Persons handling sodium hypochlorite solution spillage should be trained on safe handling of sodium hypochlorite and should be informed about the hazards associated with sodium hypochlorite.

The skin and eyes will burn when contacted with Sodium hypo chlorite. Sodium hypo vapour when inhaled will have respiratory problems.

Contact of sodium hypochlorite with skin may irritate skin.

Contact of sodium hypochlorite with eyes may cause severe irritation and

Ingestion of sodium hypochlorite solution will cause burning of mouth, nausea, vomiting, delirium and coma.

Inhalation of sodium hypochlorite vapour may cause irritation to the respiratory tract, nose and throat. Symptoms may include coughing and sore throat, bronchial irritation and pulmonary edema.

**Personal Protective Equipment (PPEs)**

Persons, who will handle sodium hypo spillage, should be provided with proper personal protective equipment.

Persons should wear proper clothing (suit, gloves, foot wear and head gear) for skin protection.

Persons should wear non Vent, impact resistant goggles when working in sodium hypo chlorite gaseous atmosphere.

Persons should wear indirect vent, impact resistant and splash resistant goggles when working with liquid sodium hypo chlorite solution.

Persons should wear face shield along with goggles to protect their face.

Employees working with sodium hypo may be required to wear proper respirators to protect against chlorine/sodium hypo vapour.

**Clean up of Sodium Hypochlorite Spill**

Notify the incident to proper authorities.

Chlorine gas will be released from the spilled sodium hypo and affect human beings, animals and environment of the surrounding area. Chlorine gas may travel further in the down wind direction if large quantity of sodium hypo spills.

General public should not enter into the affected area. Unrelated and unprotected personnel should be kept away from the affected area and be advised to stay upwind of spill area.

Contact with spilled product should be avoided.

Spilled sodium hypo should be prevented to enter into Sewers and waterways.

Sodium hypochlorite solution spilled on land may be contained by building dikes or barrier using earth, and or similar inert materials.

Recover spilled Sodium hypo as much as possible and cover the spilled area with sand.

Store the recovered sodium hypochlorite in sealed containers for disposal.

**Contaminated soil remediation**

Remove the contaminated soil from the spilled area and keep it in sealed containers for disposal.

**Waste disposal**

Recovered Sodium hypo should be neutralised with sodium bisulphite and send it to the effluent treatment plant for treatment and disposal.

The contaminated soil should be disposed as hazardous waste.

All applicable rules and regulations for waste disposal should be ascertained and observed.
Sanmar Group’s Chairman Shri N. Sankar passes away at 77

With his technical educational background in chemical engineering from AC Tech College of Technology and a masters degree from Illinois Institute of technology, Chicago, he had also hands-on experience at the plant level.

A role model for entrepreneurs and institution builders, he was characterised by a combination of business acumen and ethical conviction, and was upright, farsighted and innovative, and open to new technologies.

A role model for entrepreneurs and institution builders, he was characterised by a combination of business acumen and ethical conviction, and was upright, farsighted and innovative, and open to new technologies.

Venu Srinivasan, chairman, TVS Group, said: “Sankar was one of the pioneering industrialists of South India. I have known him over many decades and watched him lead the Sanmar Group with foresight. He was early to adopt modern management practices and focused on building competence in his companies. He pushed international growth and investment to make Sanmar a leading player globally.”

Sankar headed a number of industry organisations, at national and international levels. He was president of Assocham (1991-92), chairman, Indo – US Joint Business Council (1998-99), chairman, Madras Chamber of Commerce and Industry (1986-87), president, Madras Management Association (1981-87), and president, Indo-Danish Business Council, among others.

He served as the honorary Consul-general of Denmark in South India from 1989 to 2017. A pioneer in PVC manufacturing, he came up with some of the original choices for highly integrated manufacturing processes at various manufacturing facilities of Chemplast, the group’s flagship company for almost 55 years now.

Corporate governance was an article of faith with Sankar and his business group echoed this philosophy in its
vision statement, “Combining integrity with excellence”.

Sankar was among the pioneers to separate ownership from the management and he empowered the management with a pool of talented professionals. A third-generation entrepreneur, Sankar carved a niche for himself as an out-of-the-box entrepreneur.

With his technical educational background in chemical engineering from AC Tech College of Technology and a masters degree from Illinois Institute of technology, Chicago, he had also hands-on experience at the plant level.

He was known as a people-centric leader, spending lot of time and money to recruit talented people and train and develop them. Passion for excellence and relentless pursuit of perfection had been the hall marks of his leadership, said a statement by the Sanmar Group.

Sankar joined Chemplast in 1967 as a trainee, when his father KS Narayanan was the promoter and director. He was 26 years when he started his entrepreneurial career by acquiring a major stake in Industrial Chemicals and Monomers, a carbide manufacturing company.

He was well known for several successful joint ventures with world majors like Flowserve, Cabot, Crane, Emerson, Pentair, Tyco, AMP, BF Goodrich, Bayer, and Elf Atochem. At one time, under his chairmanship Sanmar had over 30 joint venture partners.

Sankar had concern for the environment. He was a pioneer in establishing the zero liquid discharge (ZLD) facility at all the group’s manufacturing chemical plants, when the technology was not known in the Indian industry.

Sankar had been a patron of sports such as cricket and tennis. The Sanmar family runs two cricket clubs — the Jolly Rovers, for over 50 years, and the Alwarpet Cricket Club — these clubs have produced outstanding players; a large number of them represented India. Himself a university champion in tennis, he promoted the game by sponsoring tennis talent for over the last 40 years. He was the president of Tamil Nadu Cricket and Tennis Associations and also president of the Madras Cricket Club.

He stepped in at a crucial point in the life of Madras Musings, and placed it on a sound financial footing with support from multiple corporate houses.

Sankar had great concern for public causes and supported well known healthcare institutions including the Cancer Institute, Sankara Nethralaya, Childs Trust Hospital, Voluntary Health Services (VHS) and several others.

He was also involved in the management of a number of educational and charitable organisations including Sri Sankara Schools, Chennai Willingdon Corporate Foundation and Chennai Heritage, and was a member on the board of governors of the Indian Institute of Management, Kozhikode.

AMAI pays homage to Shri N. Sankar for his great contribution to Indian Industry.
As Indian economy is targeting to grow to $5-trillion by 2025 and towards $10-trillion by 2030, steady increase in energy demand will take shape.

Government of India wants to draw up an energy transition roadmap for the oil and gas sector, that could prove to be a key step on India’s path to reach net-zero emissions by 2070. It has set up an Energy Transition Advisory Committee, which has been asked to prepare plans for alternatives to hydrocarbons. The committee has until the middle of 2022 to recommend a roadmap.

There are a few alternate strategies that the government is trying to implement and such strategies need to be examined dispassionately and without an element of wishful hope.

Objective
The objective of the roadmap is to avoid or significantly reduce the use and import of crude oil, natural gas and coal; and to achieve zero emission by 2070.

Road blocks
Excessive import dependence on crude oil and natural gas
India presently imports more than 230-mt of crude oil every year. Imports cover about 85% of India’s over- all crude oil needs. In addition, more than 50% of natural gas requirements are met by import.

It appears unlikely that domestic production of crude oil and natural gas would be increased significantly in the foreseeable future. On the other hand, it would take big efforts even to maintain production at the present levels, since the oil and gas wells are known to have definite life and new discoveries are not happening adequately. Actually, several gas exploration efforts in India have been blocked due to the protests from activists.

The above conditions imply that India would continue to depend upon the large scale import of crude oil and natural gas for long time to come, and the increase in demand/import could be 6-7% per annum.

The increasing outflow of foreign exchange due to the rising imports is a matter of high concern.

The ‘World Oil Outlook 2021’, a flagship publication by Organisation of Petroleum Exporting Countries (OPEC), has projected that crude oil demand in India is expected to reach around 11-mbpd (million barrels per day) by 2045, as compared to 4.9-mbpd in 2021.

As a matter of fact, the Petroleum Minister has clearly said in Parliament that oil and gas would continue to meet the ‘baseload’ energy demand of India in the “foreseeable future.”

Continued focus on coal production
India is a large producer, consumer and importer of coal in the world. Coal fired power plants account for the majority of electricity generation.

The projected requirement of coal
for coal-based power generation for 2022-23 is 727-mt.

Despite efforts to diversify to alternatives, such as renewable energies, coal will remain India’s major source of electricity.

Coal India, which produces 670-mt to 700-mt of coal per annum (around 80% of India’s coal requirement), aims to ramp up output to 1,000-mt by 2024.

Obviously, there is no plan to do away with the use of coal at any time in future.

**Methane emissions in India**

There is large amount of methane gas emission from livestock population, and there is no way of collecting the gas. Methane emission also takes place from usage of natural gas as feedstock/fuel and during storage and transportation of natural gas.

The share of natural gas in India’s primary energy mix has risen to 6.7% last year from 6.3% previously. The government’s target is to raise the share to 15% by 2030.

India is now committing itself firmly to import natural gas for long time to come and several LNG terminals for import of natural gas are in operation and/or under construction.

Though it is interpreted that natural gas is ‘eco-friendly feedstock/fuel,’ this is not really so, since millions of tonnes of methane emission from natural gas take place all over the world and in India too.

How can zero emission target be met without zero use of crude oil, coal and natural gas?

India has set a goal to achieve net zero carbon emissions by 2070.

If India were to have oil, natural gas and coal to meet the base load energy demand in the foreseeable future, the vexed question is how can India achieve zero emission target in the future? Even by the year 2070.

**Discussion on options**

The options available for the government to implement a road map for energy transition are challenging. Options presently being planned/implemented include:

- Massive production of electric vehicles;
- Blending of ethanol with petrol;
- Focus on increase in generation of renewable power;
- Greater focus on hydrogen generation and utilisation;
- Investment in nuclear power projects; and
- Creation of energy storage facilities.

**Electric vehicles scenario**

The International Energy Agency’s outlook for India, published recently, said India’s current policies would see a huge expansion in the transport sector. An extra 25 million trucks are expected on the road by 2040, and more than 300 million vehicles will be added to India’s fl by that time.

**Government’s hope**

By promoting the shift from internal combustion engine (ICE) vehicles to Electric Vehicle (EVs), the government not only hopes to significant cut emissions and meet its international obligations, but also reduce fuel import and improve the nation’s energy security.

The Minister for Transport has claimed that if the share of EVs were to expand to 40% in the two-wheeler and car segments and close to 100% for buses, India would be able to cut crude oil consumption by 156-mtpa, worth Rs.3.5 lakh crore. This could be considered as a hypothetical statement, more based on hope than on ground realities.

There are around 0.9-mn EVs on Indian roads now, whereas the total number of vehicles in fi year 2019 stood at 295.8-mn. The share of EVs in total number of vehicles will not be large in the foreseeable future.

**Government’s target**

Government wants to have EV sales accounting for 30% of private cars, 70% for commercial vehicles and 80% for two- and three-wheelers by 2030.

It has announced some much-needed support measures to promote EVs, which include setting up of 2,877 EV charging stations, battery swapping policy etc.

**Matter of concern**

One matter of concern about EV vehicles sector in India is that the lithium ion battery cell, which is an essential component of any EV, is not produced here. Further, several speciality chemicals/components used in lithium ion batteries are not produced in India as well.

Data from Bloomberg NEF shows that the volume weighted average price of an EV lithiumion battery (pack & cell) in the global market has come down from $684 per kwh in 2013 to about $132 per kwh as of 2021. Still, batteries and associated components constitute at least one-third of the cost of an EV, if not more, and hence, ability to bring down this cost by any means, will help higher adoption.

It appears that with the rapid growth of EV vehicles, India will become one of the largest importers of lithium ion battery cells in future.

**Putting the cart before the horse**

Can someone argue that rapid promotion of EVs, without setting up facilities for large scale of production of lithium ion batteries, could be similar to the act of putting the cart before the horse?

**Petrol/diesel vehicles will have to continue**

The large promotion of EVs will only
help in meeting the growth in the future need for transportation to some extent, as increase in demand for transportation would continue at 6-7% per annum EVs cannot reduce the present consumption of crude oil and natural gas in India to any reasonable level.

It should be noted that the budget for 2022-23, barely had any mention of traditional (petrol/diesel-run) automotive industry, where demand, particularly in the two-wheeler segment, is at an all-time high.

Does this imply that India will never be able to get rid of petrol/diesel driven vehicles in the foreseeable future?

**Government bet on ethanol blended petrol**

The government’s roadmap proposes a gradual rollout of ethanol-blended fuel to achieve E10 fuel supply by April 2022 and phased rollout of E20 from April 2023 to April 2025. Currently, 8.5% of ethanol is blended with petrol in India.

It is estimated that successful adoption of the E20 programme can save Rs. 30,000 crore per annum on oil imports.

**Promotional efforts**

The government has lowered Goods and Services Tax rate to 5% from 18% on ethanol meant for blending to promote the ethanol blending programme (EBP).

The Government has also approved 368 projects for setting up of new distilleries/expansion of existing distilleries, based on sugarcane juice, B heavy and C heavy molasses, maize, damaged food grains and rice.

It is likely that India will be able to achieve 20% ethanol blending with petrol, at least by 2030, if not earlier. However this is unlikely to reduce the present level of use of petrol significant, since the demand for petrol would steadily increase year after year at 6-7% per annum.

**Petrol consumption will continue to increase**

Considering 80% capacity utilisation, the production of ethanol by 2025 could be around 1,200 crore litres, if total capacity of 1,500 crore litres were to be built up by 2025.

**Possible supply shortage of ethanol**

With the production of 1,200 crore litres by 2025, and if 1,016 crore litres were to be used for blending with petrol (20% blend), then the country would face severe supply shortage of ethanol for other purposes including human consumption.

**Stress on renewable energy**

Govt. of India seems determinate to promote renewable power to curb carbon emissions and promote energy security. The existing capacity level of solar power is 49.35 GW. Wind power capacity is at around 40 GW and biomass power capacity is at around 10 GW. Small hydro segment accounts for around 5 GW.

Now, Government has raised the capacity target for renewable power to 500 GW by 2030, which is a very ambitious target. The government is focusing largely on significantly increasing the capacity of solar power. However, India has “limited operational annual capacities” of around 2.5-GW for solar photovoltaic (PV) cells and 9-10-GW of solar modules. Clearly solar module capacity needs to be ramped up to meet the solar power target.

**Import dependence**

India has evolved in assembling modules, but it is in processing and producing silicon wafers that capacity is wanting. Over two-third of the requirements of solar cells are presently imported from China, which remains an area of concern.

**Seasonal power**

To increase domestic production, Government has topped its first Production-Linked Incentive (PLI) scheme for making solar modules by a generous Rs. 19,500 crore.

However, it needs to be kept in view that renewable power generation depends on seasonal factors. Further, the capacity utilisation of renewable power, such as solar and wind, are only around 20%, as against around 60% for fossil fuel-based thermal power plant.

Renewable power will not be adequate While renewable power is an elegant way of power generation, considering its low capacity utilisation and seasonal nature of output, it is unlikely to significantly reduce the requirement of fossil fuels for power generation in coming years. This would particularly be so since the requirement of power in India would steadily increase in tune with the overall economic and industrial growth in the country at 6-7% per annum.

**Hope on hydrogen**

Hydrogen energy has huge development space from transportation to power generation to home application. A complete hydrogen energy industrial chain, integrating manufacturing, R&D, storage, transportation, application and consumption is sought to be developed in several countries.

India is also hoping that hydrogen energy would enable the country to relieve itself from the dependence on fossil fuel and help in achieving the reduction in CO₂ emissions. Through its National Hydrogen Mission, the government has announced specific policy interventions to push for the widespread adoption of green hydrogen.

Hydrogen must be separated from...
other substance, like water or fossil fuels. For example, industries like oil refiners use large quantities of so-called grey hydrogen that is mostly made by separating hydrogen from natural gas. And that process generates greenhouse-gas emissions. In fact, less than 5% of the hydrogen produced today is emission-free.

**Water electrolysis process**

The issue with regard to green hydrogen by water electrolysis is the fact that it is power intensive. Every kilogramme of green hydrogen production requires 48 kWh of power. The production of massive quantity of green hydrogen to the required level in India would demand huge quantity of power. If such power requirement were to be met by renewable energy source, it would be a welcome proposition. However, this is unlikely to happen due to the low capacity utilisation and renewable power generation due to seasonal factors.

It would be counter-productive to produce green hydrogen by water electrolysis, using thermal power generated by burning fossil fuel.

Another major challenge is cost of production of green hydrogen. To bring down costs, the cost of the electrolyser which splits water has to be reduced. Possibly, higher scale of green hydrogen plants can bring down the cost to some extent. Another challenge is the inefficiency of the electrolyzers – basically, how much electricity it consumes to produce a kg of hydrogen.

The Government of India is taking proactive steps with plan to set up 5-GW of electrolyser capacity for green hydrogen production, in the first phase of green hydrogen projects.

**How much green hydrogen India needs?**

The current consumption of hydrogen in India is about 5.6-mt, but almost all of it comes from the ‘steam methane reforming’ process, which emits carbon dioxide.

So, today, if the country were to replace all the hydrogen in use with green hydrogen, the annual demand for green hydrogen would be around 5.6-mt. To produce this much, electrolyser capacity of more than 110-GW is required.

Roughly, the production of one tonne per annum of green hydrogen requires 18-GW of electrolyser capacity, which in turn require 26-GW of solar power.

It is unrealistic to think that all the hydrogen used could be switched over to green hydrogen.

There are several research initiatives under way around the world to produce green hydrogen with lesser cost of production and greater efficiency. But, all such efforts are still in the study stage and it is too early to predict commercial success and if so when.

Meanwhile, several announcements about green hydrogen projects have been made in India, which make pleasant reading, even if they may be wishful thinking at the present stage due to various uncertainties.

Government of India need to be much more realistic in working out its targets for production of green hydrogen.

**Innovative project using renewable energy and green hydrogen**

A few innovative projects are coming up where renewable energy, green hydrogen and microgrids converge to complement each other.

NTPC Ltd. is setting up a floating solar renewable energy powered fuel cell-based 50 kW microgrid as a pilot at its 2,000 MW Simhadri thermal power plant near Visakhapatnam.

At Simhadri, NTPC has already set up a 25 MW floating solar project, and with the expertise of Bloom Energy, it is now developing a standalone fuel cell-based microgrid with hydrogen production.

Hydrogen will be produced by the advanced 240 kW solid oxide electrolyser using the power generated by the floating solar project during the day. The hydrogen is then stored at high pressure for use by a 50kW solid oxide fuel cell.

The system would work in a stand alone mode from 5 pm to 7 am. The project’s configuration has been designed in-house. The company currently has an installed capacity of over 67,907.5-MW.

This will be India’s first green hydrogen based energy storage project and one of the world’s largest. It could be a precursor to large-scale hydrogen energy storage projects, and useful for studying and deploying multiple microgrids in various offgrid and strategic locations of the country.

**Nuclear power project**

India has at present 23 reactors with total capacity of 7,480-MW, including the 700-MW KAPP-3 that was linked to the grid in January 2021.

In addition, there is a plan to build a fl of ten units of 700-MW of Pressurized Heavy Water Reactors, which would add another 7,000-MW. And then, 8,000-MW of nuclear power plants are at various stages of construction, including the four Kudankulam units and the 500-MW Prototype Fast Breeder Reactor.

The government expects the country to have 22,480-MW of nuclear power by 2031.

Nuclear power projects is an excellent initiative as nuclear power is eco-friendly and can operate at 100% capacity utilisation, unlike renewable energy projects. However, considering the level of investments involved and
protest against nuclear projects by vested interests, it is doubtful whether India would be able to step up nuclear power capacity to very high level.

It may be noted that in France, around 70% of the power requirement is met by nuclear power projects. Can this happen in India?

**Energy storage systems**

Energy storage system technology, including battery energy storage systems (BESS), pumped hydro energy storage (PHEs) or other technologies will be essential in order to integrate and store large volumes of renewable energy.

India aims to have 500-GW renewable power by 2030. By then, India would need 38-GW battery storage and 9 GW of thermal power balancing power projects, as well as cost efficient and reliable integration of renewables.

India currently has just 20-MW of installed battery storage capacity with 1.7-GW of battery capacity in the pipeline.

To enhance domestic manufacturing of advanced chemical cell (ACC) battery storage, the Department of Heavy Industry, Government of India, issued a notification for the Production Linked Incentive Programme (PLI) on ACC battery storage.

While significant efforts are being put forth, India has to go a long way to build up required level of energy storage capacity.

**Other options ignored by Government of India**

There are other attractive options for renewable power generation based on algae and jatropha. Unfortunately, little attention is being paid to such opportunities.

**Algae biofuel**

Algae take sunlight and carbon dioxide as building block and make long chains of oil that can be converted to biodiesel. Algae can be cultivated in saline/brackish water/coastal seawater, on nonarable land, and do not compete for resources with conventional agriculture.

Algae synthesize and accumulate large quantity of oil [20–50% dry cell weight (DCW)] and grow at high rates (e.g. 1 to 3 doublings per day).

Land availability in India for algae cultivation in India includes 63.5 million hectare of wastelands and 3.7 million hectares of marshy and alkaline/saline lands.

The scope for investing in algae project is promising because algae can produce between 7,500 and 19,000 litres of fuel per acre, far more than any other renewable feedstock. Additional economic value is possible through production of high value co-products during the production of biofuel that include ethanol, methane, hydrogen, nutraceuticals, animal feed and bio-fertilizers.

The use of algae biofuel would help drastically reduce GHG emissions from medium and heavy duty trucks, aircraft and ships.

The European Union Renewable Energy Directive, which sets targets for the proportion of renewables required to contribute to the energy market, is being amended to value the contribution of algae biofuels as four times their energy content. This means that suppliers of biodiesel produced from algae will receive four times the amount of government support compared with growers of land-based oil crops.

A number of algae biofuel projects are successfully operating in developed countries.

Considering the availability of waste land/marshy land in India, it is feasible to set up algae farm of at least one million acre in different parts of the country in the next few years. Obviously, such algae farm has to be located in waste lands. It would be appropriate to have individual algae farm of 1000 acre in each location.

Several experts think that massive cultivation of algae and production of biofuel from it can relieve India from energy crisis situation to a considerable extent.

**Jatropha biofuel**

When Mr. Atal Behari Vajpayee was the Prime Minister of India, there was huge claim that production of jatropha biofuel would be the ideal strategy to tackle the problem of impending energy crisis and reducing import dependence on fossil fuel. The virtues of jatropha biofuel were highlighted in several forums and it became the talk of the day.

However, nobody talks about the jatropha biofuel at present and this project is declared to be uneconomic and unfeasible due to various reasons, including low yield of oil.

Obviously, adequate research efforts have not been put forth to improve the yield of oil from the jatropha seeds and recovery of oil. The dream of jatropha biofuel has gone with the wind.

**Likely scenario in 2030**

Considering that the target set for year 2030 by Government of India for EVs, blending of ethanol with petrol etc. would be met, the likely scenario in 2030 is assessed as below:

**Ethanol blending with petrol**

Likely consumption of petrol by 2030 without considering ethanol blending with petrol and considering growth rate demand of 7% per annum: 49-mt.

Considering 20% ethanol blend with
petrol, the requirement of petrol to be made available by utilising fossil fuel in 2030: 39-mt.

**Renewable energy**

Likely total peak hour demand for power by 2030: 320-GW.

Considering 500-GW of renewable power capacity by 2030 and considering average capacity utilisation of 20%, the renewable power available by 2030 would be 100-GW.

Balance peak hour demand to be met by fossil fuel in 2030: 220-GW.

**Electric vehicles**

Number of vehicles on road (all types) by 2030 considering 7% growth rate per annum: 580-mn.

Considering 0.9 million EVs (all types in 2021 and considering 25-30% growth per annum in the production of EVs, the total number of EVs in 2030: 10-mn.

Number of vehicles on road excluding electric vehicles in 2030 to be run with fossil fuel would be still very large.

**Can India achieve zero emission at any time?**

Government of India is carefully examining the various options for India to achieve zero emission by 2070, as committed during the recent Glasgow Meet. However, the ground realities indicate that India is unlikely to achieve zero emission even by 2070.

India is a large importer of crude oil and natural gas and demand and import level is likely to increase steadily, as domestic production is likely to remain at near stagnant level. India is now planning to increase coal production to one billion tonnes per annum.

Obviously, crude oil, natural gas and coal would continue to meet the base load energy demand of India in the foreseeable future. Several alternate schemes to reduce the emission levels and reduce dependence on crude oil, coal and natural gas are being implemented such as promotion of EVs, increase in production of renewable energy, development efforts towards hydrogen economy, promotion of nuclear power projects, etc. All such efforts would certainly lead to the replacement of crude oil, natural gas and coal to some extent.

However, demand for energy is likely to increase significantly in the country at 6-7% per annum and India would emerge as one of the largest consumers of energy in the world in the coming years. The efforts to promote alternate strategies such as EVs etc. can offset only part of the likely increase in demand for energy, that is now being produced from fossil fuel.

While government of India is thinking forward, viewing the ground realities, one is not sure whether India’s current energy transition strategies would be adequate to overcome the challenges in achieving zero emissions!
The chemical industry is one of the biggest driving forces of the economy. The logistics and supply chain of this industry is particularly different from other industries’ processes mainly because of three reasons. First, production & consumption of chemical products is mostly at distant & separate locations so transportation needs to be in prime focus. Secondly, 96% of manufacturing goods depend on chemicals for direct or indirect usage hence, the industry needs to work round the clock to meet the market requirement. And lastly, the product, if not handled properly, can itself be hazardous in nature so one needs to be extra cautious while working with chemicals.

In order to bring in logistics efficiency, technology should be targeted and implemented across people, places & processes over the entire chemical supply chain.

Areas that need technological advancement

When it comes to chemical logistics, the entire movement of products needs to be planned meticulously. Safety, quality, and reliability need to be in focus, right from production till delivery of products to end-users. That is one of the main reasons behind higher logistics costs in this industry.

Let us understand how technology can impact the different areas of chemical logistics in detail.

Manufacturing

The risk factor is really high when it comes to manufacturing chemicals that are unstable in nature. The quantity produced should be in tandem with the quantity required; hence, it is imperative to accurately predict demand of the product. Additionally, one needs to be really cautious while capturing all the production-related information like manufacturing date, expiry date, conditions for usage, etc.

Technology helps align all of these requirements on one single platform. Artificial Intelligence (AI)-enabled supply chains, along with machine learning algorithms, capture real-time data along with information from the production lines to ensure that a balance of demand & supply is achieved. This balance is particularly important in chemical logistics to avoid the additional risk associated with handling the over-produced chemical products.

Petrochemical companies & refineries nowadays are using technology to automate and simplify their processes. For example, a leading German producer, recently adapted machine learning (ML) technology to interpret customer requirements & give inputs to manufacturing units to prepare the paints in the composition required by the clients.

Freight & Transportation

The overall infrastructure plays a very important role in the transportation of chemical products within the supply chain. The deliveries should be planned considering the transit time & ambient conditions of transportation. All the necessary hardware installation should be done in transportation
vehicles to ensure information is constantly recorded & communicated to respective stakeholders. Location tracking devices, along with temperature & humidity monitoring probes, are a must. Nowadays a variety of devices are available in the market with both wired & portable setups that can be used for own as well as market vehicles to ensure complete transportation visibility. Al-driven route & load optimisation solutions work wonders when it comes to timely delivery of chemical products in the right condition, at the right time and the right place.

Safety of the driver & vehicle is another important factor when it comes to management of chemical logistics. Al & ML based solutions continuously gather data and anticipate potential risks, even before the incidents happen.

Few other features that cater to safety are: SOS button installation; instant alerts & communication; night & continuous driving alerts for drivers; maps enabled with near-by safety services; and many more.

Thankfully, there are a lot of technological advancements in the area of transportation of chemical goods and if implemented and used well, can definitely contribute to reduced logistics costs with greater safety.

**Warehousing**

Unmanaged inventories are certainly costly. Excess chemical inventory results in chemical wastage that can hamper the environment & shortage will not allow the company to meet its customer requirements. Hence, warehousing for both raw materials and produced chemicals is a crucial part of chemical supply chain management. The traditional ERPs & WMS cannot work alone; automation & software integration are also needed to efficiently manage the complete warehousing process. Quality assurance reports for all products, from transit to delivery, should be maintained on one single platform of the software solution. On the basis of product condition and warehousing algorithms like FIFO, LIFO, etc., the right product should be dispatched for delivery from the warehouses. Compliance reports and dashboards should also be maintained to record the warehouse’s productivity. Thus, only the right kind of technology can record and analyse this information to bring in increased efficiency across chemical warehouses.

**AI for Chemical Supply Chains**

AI can bring immense benefits when it comes to chemical supply chain management. AI-based solutions use predictive analysis to anticipate potential risks and analyze demands. Such solutions also optimize the overall processes by capturing the real-time information & processing it to give important insights that can help bring in more efficiency across the supply chain. Along with operational efficiencies, these solutions can also help maintain compliance regulations throughout chemical logistics. By adopting cloud technologies, companies can work on the existing data while capturing new information, thus saving on time to create complex composition of chemicals. The key focus areas of the chemical supply chain – efficient production models, lower transportation costs, and greater safety and reliability – can be undeniably achieved with the help of AI-enabled solutions.

Mr. Sanket Seth is the Founder & Managing Director of Elixia Tech Solutions Ltd. (https://elixia.tech/). The company provides an end-to-end control tower solution that can keep a track of product movement across the supply chain. Elixia Tech Solutions has dealt with multinational chemical companies and have helped them gain increased visibility and control over their supply chains. Some of the key features of Elixia’s supply chain control tower that are particularly helpful for chemical supply chains include load & route optimisation, temperature & humidity monitoring, product tracking, delivery confirmation and even financial reporting.
Incident

According to the reports the tanker was carrying 23 tonnes of Hydrochloric Acid from Karwar to Kochi when the incident took place early on Sunday morning. On 5th September 2021. The driver of the tanker and the cleaner escaped with minor injuries. No other person injured in the incident.

Incident Control

A team of fire fighters rushed to the spot and undertook all the precautionary measures and took control of the situation by spraying water on the leaking hydrochloric acid vapour.

Root cause

The driver of the tanker lost control over the wheels and rammed the tanker into the road divider before the vehicle toppled and screeched for about 30 meters.

Recommendations

1. Night driving of vehicles transporting hazardous substance should be avoided.
2. If the driver is feeling sleepy, he should not continue driving the vehicle. Instead the driver should stop the vehicle and take rest and restart journey when he is not feeling sleepy.
3. There are devices available to check dosing of drivers during driving. These devices may be used to keep check on the driver to prevent road accidents.
4. Water should be sprayed on leaking acid vapours to dilute it to suppress evaporation.
5. Area should be cordoned off and general public should be kept away from the incident site.
6. Acid water should not enter into storm water drain or any water body.
7. Acid water should be neutralized with lime.
8. People handling hydrochloric acid leakage should wear proper PPES.
9. Persons affected with hydrochloric acid vapour should be provided with medical aid.
10. The soil soaked with hydrochloric acid in the incident site should be neutralised properly.

(Hari Saran Das, Honorary SHE Advisor, AMAI prepared the above report based on the information published in Vartha Bharati on 05.09.2021)
Created for those in search of perfection...!
Jal Jeevan Mission - An Update

Hon’ble Minister of Jal Shakti, India, Shri Gajendra Singh Shekhawat, met with Prime Minister of Japan Mr. Kishida

Amritmahotsav.nic.in | 21 April 2022

The Hon’ble Minister of Jal Shakti, Government of India, Shri Gajendra Singh Shekhawat, meet Prime Minister of Japan Mr. Kishida Fumio at the 4th Asia Pacific Water Summit in Kumamoto, Japan on 23-24 April, 2022. He deliberated on India's story of water conservation and how India is making it available to all and highlighted its various aspects with all participating nations. During his visit, Union Minister also visited an interesting exhibition at the venue of the 4th Asia Pacific Water Summit at Kumamoto and learned about revolutionary innovations and new technologies being deployed to solve old and new problems in water related sectors.

In addition, he also had a great meeting with Tesuo Saito, Japan's Ministry of Land, Infrastructure, Transport and Tourism, on the sidelines of 4th Asia Pacific Water Summit at Kumamoto. He had in-depth discussions on a wide range of subjects, including Johkasou technology and decentralized wastewater treatment and how the two countries can work together in this area.

Shri Gajendra Singh Shewkhat extended good wishes of Honorable Prime Minister Shri Narendra Modi to him.

https://amritmahotsav.nic.in/event-detail.html?26320

Extend Jal Jeevan Mission deadline: CM

The Times of India | 21 April 2022

Chief minister Ashok Gehlot has written to Prime Minister Narendra Modi seeking to extend the deadline for completion of Jal Jeevan Mission (JJM) by two years to March 31, 2026.

Gehlot said during the initial days of the mission from March to July 2020, the pace of Jal Jeevan Mission was very slow due to Covid lockdown. The following year too, the mission work was partially interrupted from March to July 2021 due to Covid-related circumstances.

The chief minister wrote that demand for components of the project has increased significantly due to the ongoing mission works across the country. The demand for steel and High-Density Polyethylene (HDPE) pipes in particular has increased rapidly. This has resulted in instability in the supply of components, due to which the progress of Jal Jeevan Mission projects has also slowed.

The chief minister said Rajasthan is the largest state in terms of area and it has heterogeneous geographical conditions and scattered settlements. Two-thirds of the state is desert and in the south is a mountainous area. Earlier, the timeline of projects for such difficult areas was 30 to 48 months, but now it has been reduced to 12 to 24 months. This has made achieving the target even more challenging.

Gehlot has informed that many projects including Parban Akawad Water Supply Project of Baran, Jhalawar and Kota, Rajasthan Rural Water Supply and Fluorosis Mitigation Project (Phase-II) for Barmer district based on Narmada Canal project, IGMC-based CP (I) Scheme for providing tap water to Surajgarh and Udaipurwati Jhunjhunu district, drinking water supply from Chambal river to 648 villages of Chittorgarh district, Isarda-Dausa drinking water supply project, Navnera water supply project, water supply scheme from Chambal river are big projects and there is very little chance of the work of these projects completed in 24 months.

The chief minister has said due to the war between Russia and Ukraine, there has been an unexpected increase in the prices of many commodities.


Madhya Pradesh Plans To Provide 22 Lakh Tap Connections By March, 2022

Orrisa Diary | 17 April 2022

Madhya Pradesh presented their Annual Action Plan (AAP) under Jal Jeevan Mission (JMJ)today via video conferencing setting out the State’s action plan to provide tap water connections to rural households in 2021-22 as well as the saturation plan, so that every rural home of the State gets
tap water supply in a time-bound manner. Madhya Pradesh is likely to get about Rs 3,000 Crore Central fund in 2021-22. Considering this quantum jump of allocation of almost 2.5 times of previous year, the State has to make provision for matching State share and prepare a realistic expenditure plan for effective utilization funds.

A month-long planning exercise is currently underway which involves two States/UTs presenting their AAP daily to a committee chaired by Secretary, Department of drinking Water & Sanitation, Ministry of Jal Shakti and members from different Central Ministries/Departments and NITI Aayog. The committee jointly reviews the proposed Annual Action Plan (AAP) before finalizing the same. Thereafter, fund is released in tranches throughout the year and regular field visits, review meetings are held to ensure implementation of the AAP to achieve the goal of Jal Jeevan Mission.

Madhya Pradesh has 1.23 Crore rural households, out of which 37.69 lakh (31%) have tap water supply in their homes. In 2020-21, Madhya Pradesh has provided 19.89 lakh tap water connections and has been one of the top performers in the country under Jal Jeevan Mission. In 2021-22, the State has planned for saturation of 7 districts and 22 lakh new tap water connections. The national committee advised the State to cover more districts and particularly give emphasis to increase the coverage in priority areas such as SC/ST dominated habitations, water quality-affected areas, water-scarce areas, Aspirational districts, PVTG habitations, etc.

The State was asked to give priority to water testing for bacteriological & chemical contamination of water. Community to be encouraged for surveillance of water quality. PHE Department is facilitating to empower and engage with the community. For this, an action plan is carried out to incorporate the various planned activities like timely procurement of kits, supply of kits to the community, identification of at least five women in every village, training women for use of Field Test Kits and reporting and collating the reports with laboratory-based findings of the water sources. The State has done some remarkable work by accrediting 28 water testing laboratories last year and it will be helpful for the people to go to these laboratories to test the quality of water. The State also plans to take up NABL accreditation of 23 out of 51 district labs in 2021-22.

Union Government’s flagship programme, Jal Jeevan Mission – Har Ghar Jal is under implementation in partnership with States/UTs to provide household tap water connection to every rural home of the country by 2024. In 2021-22, in addition to the Rs 50,000 Crore budgetary allocation for JJM, there is also Rs. 26,940 Crore assured fund available under the 15th Finance Commission tied-grants to RLB/PRIs for water & sanitation, matching State share, other sources like District Mineral development fund, MGNREGS, etc. as well as externally aided projects for drinking water supply works in villages. Thus, in 2021-22, more than Rs. 1 lakh Crore is planned to be invested in the country on ensuring tap water supply to rural homes. This kind of investment is likely to continue over three years to achieve ‘Har Ghar Jal’, which is a boon for the rural economy.

The State Action Plan is prepared by States/UTs to provide 100% of rural households with tap water connections and achieve overall drinking water security in villages. This is the master plan with detailed information on several schemes to be retrofitted/new drinking water supply schemes to be taken up to achieve saturation along with timelines to initiate and complete and commission the schemes on the ground for regular and long-term supply of safe drinking water to rural homes. It also identifies different funding sources for convergence for judicious utilization of funds, firm up State O&M policy, intensify IEC/activities, Water Quality Monitoring & Surveillance activities, invest in sensor-based IoT technology for real-time monitoring and measurement of water supply, etc.

Now, in the times of the Corona pandemic, it has become very important to deal with the issue of water scarcity, contamination as well as provision of water in rural homes. Clean water will promote better hygiene and a functional tap in household premises will ensure physical distancing by avoiding crowding at public stand posts. Thus, the State needs to expedite the works during this challenging time.


Jal Jeevan Mission giving new impetus to country’s development: PM Modi

Business Standard | 09 April 2022

Emphasising the Centre’s commitment to providing water supply to every household, Prime Minister Narendra Modi
on Saturday said that Jal Jeevan Mission is giving new impetus to development of the country.

Taking to Twitter, Prime Minister said that Jal Jeevan Mission is giving new impetus to the development of the country today. He said that in less than three years, water has reached crores of households which is a great example of public aspirations and public participation.

According to the central government, only 3.23 crore households were connected to supply water till 2019. Since the inception of Jal Jeevan Mission in 2019, 9.40 crore households have been connected with the supply water facility.

Around 1.5 lakh villages in 107 districts in the country have benefitted from Jal Jeevan Mission. 17.39 lakh schools and Anganwadi Kendras are connected with the drinking water supply.

For drinking water management in villages, 4.82 lakh water committees are constituted. Around 9.69 lakh women in villages are trained, to check the quality of water. More than 4 lakh villages have the facility to test the water quality at the local level.

Prime Minister said besides supplying water to households, Jal Jeevan Mission is a great medium for decentralization. He emphasised that the mission is driven by women in rural India.


Achieve target under Jal Jeevan Mission first phase by month-end: Minister

The Hindu | 05 April 2022

Transport Minister and in-charge of Ballari district B. Sriramulu has directed officials concerned to ensure that every household in the district gets tap water under the Union Government’s Jal Jeevan Mission.

Responding to Executive Engineer of Rural Water Supply and Sanitation Department who, at a review meeting held at the Zilla Panchayat Conference Hall in Ballari on Tuesday, said that 15,719 households in the district have been provided with water taps against the target of 20,613 in the first phase under Jal Jeevan Mission, the Minister directed the officer to complete the target before April 30.

“You have to reach the target of providing all the 15,719 households with water connections before April 30 by speeding up the works. You have to take stringent action against the contractors who fail to meet the targets within the stipulated time,” Mr. Sriramulu said.

The Minister also told the officer to initiate the process for taking up second and third phase works under the Jal Jeevan Mission.

“Households that have not been provided with water connection in the three phases of Jal Jeevan Mission should be covered in the fourth phase to ensure that all of them in the district get pure drinking water through taps. I will extend all cooperation for the implementation of the Mission in the district,” Mr. Sriramulu said.

As per information provided in the meeting, there are 1,92,628 households in the district and the administration has set a target of providing drinking water through taps to 1,24,282 households in three phases. The remaining 68,000 households will be provided with tap connection in the fourth phase.

“We have taken up 10,505 Jal Jeevan Mission works under MGNREGA and spent ₹104 crore thus far. The district has achieved 103% progress in the creation of man-days,” an officer of the Zilla Panchayat told the meeting.

Hostels

On the demand for additional hostels under the Social Welfare and Backward Classes Welfare departments, the Minister said that he is aware of the requirements and promised to do everything to meet them.

“Just provide me with a list of places that need new hostels and we will see how we can address the demand. There is a requirement of ₹50 lakh for completing the work on Babu Jagjivan Ram Bhavan and I will take steps to get the amount released at the earliest possible. A sum of ₹4 crore is released for installing seats, sound system and other equipment in the Valmiki Bhavan in Ballari. The officials concerned should ensure quality work,” Mr. Sriramulu said.
Zilla Panchayat Chief Executive Officer J. Lingamurthy and other senior officers were present.


**Budget 2022-23: Centre allocates Rs 9,289.15 cr to J&K JJM, Rs 6,412.71 cr more to last year’s allocation**

*The Times of India | 05 April 2022*

The Union government, in its objective to give a push to Jal Jeevan Mission (JJM) in Jammu and Kashmir has allocated a whopping sum of Rs 9,289.15 crore to the UT under Jal Jeevan Mission 2022-23, which is Rs 6,412.71 crore more than the previous year’s budget allocation.

"In 2021-22, the Centre had allocated Rs 2,747 crore which was nearly 4 times more than the preceding year 2020-21. This year the government has allocated a staggering amount which is nearly more than double to its previous year budget, said an official here today.

He said, “This substantial increase in JJM budgets every year is reflective of the concern and seriousness of the government towards materializing its commitment of providing tap water connections to every household and capacity building of Water Quality Management through testing, monitoring and surveillance”.

Jal Jeevan Mission has been envisioned to have drinking water supply in rural areas, adequate quantity of prescribed quality on regular and long term basis at affordable service delivery charges leading to improvement in living standards of rural community.

“The Union Territory of Jammu and Kashmir contemplates to become ‘Har Ghar Jal’ Union Territory by the financial year 2022-23 and out of total 18.35 lakh rural households in the UT, 10.39 lakh (57%) households have tap water connections.”

Official said, “In a significant achievement, Srinagar and Ganderbal districts have achieved the target of having 100% households with tap water connections.”

“Efforts are also being made to ensure tap water availability for drinking, cooking mid-day meals, washing hands and usage in toilets in all schools and Anganwadi centres. As on date, 22,421 schools (100%) and 23,926 (100%) Anganwadi centres in J&K have been provided with tap water supply.”

Considering the importance of water testing for monitoring operation of water supply, verification of safety of drinking water and investigation of disease outbreaks, 2.50 lakh water quality tests have been planned to be conducted in 2022-23, he said.

“Besides, accreditation of all 20 district water testing laboratories will be achieved and all sub-divisional laboratories will be registered during 2022-23 under National Accreditation Board for Testing and Calibration Laboratories (NABL), official said, adding, “also, 1,589 water supply schemes have been targeted to be completed during 2022-23.”

Meanwhile Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) has been formulated with the vision of extending the coverage of irrigation ‘Har Khet ko pani’ and nearly 43 ongoing minor irrigation schemes under Accelerated Irrigation Benefit Programme – Prime Minister’s Krishi Sinchayee Yojana (AIBP-PMKSY) will be physically completed during 2022-23. Besides, 28 thousand hectare of Irrigation Potential has been targeted to be created and stabilized during 2022-23.

Similarly, balance portion of work on Tawi Barrage costing Rs 73.34 crore is expected to be completed during 2022-23. The work on Ujh Multi-Purpose Project (UMPP) is also expected to start during 2022-23 for which Detailed Project Report (DPR) stands redesigned. 196 MW Ujh Multipurpose Project (Hydropower, Irrigation and Drinking) is first of its kind in Jammu and Kashmir which envisages utilization of water resource potential of River Ujh, a tributary of River Ravi.

In addition, flood protection works costing Rs 27.91 crore for safeguarding the All India Institute of Medical Sciences (AIIMS) site at Vijaypur, Jammu, have also been targeted to be completed by 2022-23.

“The Jal Jeevan Mission has been transforming the face of rural water supply across UT over the last two years. And the transformative budget of 2022-23 will allow for an unprecedented reach to the rural and backward regions of
Centre Releases Rs 40,000 Crore Grant To States/UTs Under Jal Jeevan Mission

The Central government has released over Rs 40,000 crore as grant to states and Union Territories (UTs) in the financial year 2021-22 under the Jal Jeevan Mission that seeks to ensure tap water connections to households across the country, according to the Union Ministry of Jal Shakti.

The grant money has been released to the states and UTs based on the output in terms of providing household tap water connections and utilisation of available Central grants with matching State share.

The budget under Jal Jeevan Mission for 2022-23 has been enhanced to Rs 60,000 crore by the Central government, thereby making it evident, the importance of ‘Har Ghar Jal’ programme. Water is central for all developmental works and providing potable water will go a long way in ensuring ‘ease of living’ to the rural population living in far-flung areas across the country.

Since the announcement of Jal Jeevan Mission on August 15, 2019, so far, more than 6 crore households have been provided with tap water connections, thus increasing the tap water supply from 3.23 crore (17 per cent) to more than 9.35 crore (48.4 per cent) rural households in the country.

This ‘speed and scale’ of the works being undertaken for making provision of clean drinking water to every rural household needs to be sustained to ensure all 6 lakh villages becomes “Har Ghar Jal” by 2024.

The mission focuses on an assured supply of potable water to every home and the work is not just limited to merely infrastructure creation. Massive training and skilling programme are being taken up to build the capacity of public health engineers, State and District officials and local community, ensuring active participation, regular monitoring and long-term sustainability of the infrastructure created.

The mission envisages that Public Health Engineering Department and Gram Panchayats/ Village Water & Sanitation committee play the role of a public utility.

Despite COVID-19 pandemic and resultant lockdowns and disruption in the last two years, the implementation of Jal Jeevan Mission has made significant progress and during the current financial year, more than 2.06 crore rural households have been provided tap water connections.

Presently, Andaman & Nicobar Islands, Dadar & Nagar Haveli and Daman & Diu, Goa, Haryana, Puducherry and Telangana have become ‘Har Ghar Jal’ States/ UT and every household in 106 districts and 1.45 lakh villages of the country, have tap water supply.
On July 12, 2020, a fire broke out on the US Navy ship USS Bonhomme Richard while it was docked in San Diego, California. The fire burned for 5 days and spread to 11 of the 15 decks of the ship. Temperatures from the fire exceeded 1400 °F (760 °C). The financial loss was more than 3 billion dollars, and the ship was decommissioned.

Following the fire, the US Navy conducted a study of 15 fires which had occurred in ships over a 12-year period prior to the Bonhomme Richard fire. This study identified multiple recurring causal factors, both in how the fires started, and how they escalated. Several of the causal factors in the Navy ship fires are also potential causes for a fire, or for a fire to grow into a more severe incident, in the process industries.

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Some findings from the US Navy investigation which are relevant to process industry plants include:

- Unauthorized materials were brought onto the ship.
- Combustible and hazardous materials were handled and stored improperly.
- Procedures were not followed, and inspection programs were ineffective.
- Excessive amounts of combustible and hazardous materials were stored in portable containers with no recognition of the fire risk.
- There was no comprehensive review, approval or oversight of hot work, and there was no temporary fire protection or fire response plan in place.
- Personnel were not proficient in the use of fire detection and suppression systems and emergency communications equipment.

- If your plant handles flammable, combustible, or other hazardous materials in portable containers, always store the containers in properly designated areas which are compliant with regulations and standards for storage of those materials.
- Return unused material in containers to designated storage areas immediately when you determine they are no longer needed in the production area.
- Rigorously follow your plant procedures for hot work and other work which requires a permit.
- Participate in emergency drills and report any issues you observe during the drills so that emergency procedures can be improved.
- If your plant has not had an emergency drill recently suggest that one be conducted.
- Skim through the referenced US Navy report and look for other lessons relevant to your plant.

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General

Capital expenditure in manufacturing gets big push in 2021-22

*The Print | 28 April 2022*

Private sector capital expenditure (capex) in manufacturing surged by around 150 per cent in 2021-22 year-on-year backed by mega project announcements in steel, cement and auto sectors, Goldman Sachs said in a report.

New investment/capex announcements by the private sector saw a 145-150 per cent increase in FY22, compared to FY21/FY20, Goldman Sachs noted in the report titled ‘Make In India’ tracker.

The manufacturing sector, which has lagged for multiple years, saw an increase of 210 per cent/460 per cent in FY22, compared to FY21/FY20.

While the increase was aided by mega project announcements (especially in the Steel sector), the number of projects announced also increased by 80 per cent/140 per cent in FY22, compared to FY21/FY20, the report said.

The growth was contributed by both traditional sectors like petrochemicals, steel, cement and automobiles, and new-age sectors like electronics, e-vehicles and Data Centers.

The government contracts also gave a big push to the Make in India initiative. Contract awarding saw an overall increase of 55 per cent year-on-year in FY22, and the manufacturing sector witnessed a growth of 135 per cent year-on-year.

Growth in awards for infrastructure projects has been decent as well, primarily driven by higher activity in the roads sector.

The report also has a chapter on the Production Linked Incentive (PLI) scheme of the government.

In order to give a push to the ‘Make in India’ initiative, the Government of India proposed Production Linked Incentive schemes for 13 sectors during FY21, at a proposed incentive outlay of $26.7 billion. This excludes the PLI scheme on semiconductors.

**ReNew Power inks 5 PPAs to supply around 1500 MW solar energy**

*The Economic Times | 28 April 2022*

ReNew Power said it has signed five power purchase agreements (PPAs) for the supply of around 1,500 MW electricity generated from solar plants.

The company has signed PPAs with Solar Energy Corporation of India (SECI) and Punjab State Power Corporation Ltd (PSPCL), as well as multiple long-term purchase agreements with corporate buyers together totalling around 2 GW, a company statement said.

This has seen the company’s gross total portfolio jumping to 12.1 GW from 10.2 GW at the beginning of this calendar year.

The new utility solar projects will be located in the western state of Rajasthan and have flat tariffs over 25 years.

Four solar PPAs have been signed with SECI and one with PSPCL. Two PPAs of 600 MW and 375 MW are under the SECI Rajasthan IV scheme, where ReNew will supply electricity at Rs 2.18/kWh.

The other two PPAs with SECI for 300 MW and 100 MW are under the SECI IX scheme and have a tariff of Rs 2.37/kWh.

The ReNew recently acquired a beneficial interest in the 300 MW (SECI IX) and 375 MW (SECI Rajasthan IV) projects, subject to the terms of the respective PPAs.

For the PSPCL PPA of 100 MW, ReNew will supply electricity at Rs 2.33/kWh. All the projects are expected to be commissioned by the fourth calendar quarter of 2023.

Corporate buyers have signed long-term agreements with ReNew for the purchase of clean energy or renewable energy credits for approximately 0.5 GW (491 MW), with energy tariffs ranging between Rs 3.06 to Rs 3.95/kWh.

The corporates include a large US-based global tech major, Grasim Industries, and Netmagic, a subsidiary of NTT Communications, Japan.

This takes ReNew’s overall corporate portfolio to over 900 MW, making it one of the largest renewable energy solutions providers to corporates, it stated.

ReNew recently also announced an investment by Mitsui & Co. Ltd in its 1.3 GW round-the-clock renewable
energy project, and a joint venture with Indian Oil Corporation and Larsen & Toubro for developing green hydrogen capacity in India.

102 priority items on government’s list to raise domestic manufacturing, cut imports

*The Economic Times* | 28 April 2022

Gold, natural gas, crude palm oil, integrated circuits, personal computer, insulin injection, cameras, urea, antibiotics, turbo-jets, lithium-ion accumulators, refined copper, machines and mechanical appliances, are among 102 priority items that the government has identified whose imports are high and need immediate interventions for domestic production opportunities. These comprise 57.66% of India’s total imports. In an analysis of India’s imports, the commerce department said that of the 102 products, emphasis may be given to 18 items which have been consistently growing and have a significant share consistently across the long, medium and short terms.

“As the data indicates these items have been demanded consistently for import in all periods and supply rigidities for these items in the domestic economy needs to be corrected,” the commerce department said in an analysis of import items for domestic production opportunity.

The study, done on HS codes at 8-digit (tariff lines), analyses items which have an average import value of $500 million for March-August 2021 (short run) and $1 billion per year across three years (FY19-FY21) and ten years (FY12-FY21).

“Industry associations, manufacturers and business leaders may consider exploring domestic capacity expansion in these items with a view to meet the unmet domestic demand which in turn will fuel economic growth and create employment opportunities,” the department said in the report. In FY22, India’s imports were a record $611.89 billion.

The ministry has also identified 88 items with high growth potential. Maximum number of products-18- have been identified for the Department of Chemicals and Petrochemicals, 15 for the Department for Promotion of Industry and Internal Trade, 13 for Ministry of Electronics and IT, and nine each for heavy industries and mines ministry.

Andhra Pradesh govt readying master plan to attract industries to state

*The Times of India* | 27 April 2022

The state government is coming up with a master plan to launch campaign to promote and attract industries to the state. With over 2,700 crore budget allocated exclusively for the infrastructure development in the industrial areas, the government is all set to intensify the campaign across the globe.

A team of investors are scheduled to visit the state in the first half of May from Dubai, who were motivated by late minister Mekapati Goutham Reddy. The team is scheduled to interact with chief minister YS Jagan Mohan Reddy and the senior officials and explore the possibilities of coming with investments.

The chief minister himself is scheduled to join the World Economic Forum meet in Davos scheduled from May 25. The department is currently busy preparing blueprint to be presented at the Davos meet and attract the industries.

Gujarat HC notice to pollution boards on hearing for environment impact

*The New Indian Express* | 27 April 2022

The Gujarat High Court issued notice to the Central Pollution Control Board (CPCB) and Gujarat Pollution Control Board (GPCB) on a Public Interest Litigation (PIL) challenging a public notice issued by the GPCB for a consolidated public hearing for environment impact assessment (EIA) for eight different projects by Adani Enterprises, scheduled for April 30.

The PIL was moved by Kheti Vikas Seva Trust through its president Naran Bharu Seda Gadhi. The trust, comprising farmers, fishermen, and local villagers in Kutch, has submitted that the GPCB’s notice for a consolidated hearing for eight different Adani projects is “oblivious to the requirement” that “there cannot be consolidated public hearing for different projects” as per a Delhi High Court judgment of 2009.

A division bench of Chief Justice Aravind Kumar and Justice AJ Shastri issued notice to the CPCB) and GPCB, while the state government and the Kutch district Collector have also been made parties to the litigation along with the Union of India and Adani Enterprises.

The court, while issuing notice, added that “any decision taken by the respondents would be subject to the result of this petition”. According to the petitioner, a public notice was issued on March 18 for a public hearing on April 30 for eight projects by Adani Enterprise.

The eight projects include manufacturing of a semi coke unit, calcium carbide unit, acetylene unit, VCM unit, PVC unit, caustic soda unit, ethylene glycol unit and cement plant, near two villages — Vandh and Tunda — in Mundra, Kutch, averred as ‘Category A’ projects.

The public notice requested all affected local residents to remain present at the hearing or send their responses in writing to member secretary of GPCB before the hearing date, noting that the public hearing is scheduled to be held at 11 am, on
Among men, the participation rate declined to 67%, from more than 74%. The dip in the participation rate was higher in the urban areas.

The rate slid to 37.5% from 44.7% in urban areas — a more than seven percentage point drop. The rate in rural areas fell to 41.4% from 46.9%. Of the 24 States with data, 23 saw participation rates decline in March 2022 compared with March 2016.

The rate dropped in all the States, except in Rajasthan. The slide was more pronounced in two southern States, which had a high participation rate to start with.

Andhra Pradesh and Tamil Nadu had participation rates of 54% and 56%, respectively, in March 2016, and witnessed the sharpest declines. Between 2016 and 2022, participation rates fell 20 percentage points and 17 percentage points for Tamil Nadu and Andhra Pradesh respectively.

Corporative affairs ministry looks to monetize company database

Live Mint | 26 April 2022

The corporate affairs ministry is looking to monetize the vast database of firms operating in India, which is now available to users through the MCA21 portal on payment of ₹100 per company, two people aware of the development said.

The ministry has held meetings with credit rating firms, which rely on government data sourced from third-party agencies, to evaluate the possibility.

“Data available on MCA21 are sold by third-party aggregators for as much as ₹1,500 per firm after doing some value addition,” an industry executive said, asking not to be named.

A second executive aware of the meeting with rating firms said the ministry is considering selling data sets in user-friendly formats, making them more valuable and accurate than the data provided by third-party aggregators. Monetizing the data could lead to a new source of revenue generation for the ministry, which may also seek the views of other stakeholders.

Queries sent to the ministry of finance and corporate affairs on Monday did not elicit a response as of press time.

The ministry is revamping MCA21 and is increasingly using technology to oversee compliance and improve ease of doing business. It expects the upgradation of the website to help in quicker data analysis and spotting compliance-related trends of over 1.4 million active firms and over 220,000 limited-liability partnerships. Early detection of trends, such as auditors quitting assignments prematurely, is expected to help improve regulatory oversight and policymaking.

The new version of MCA21 will link up with the systems of other financial and corporate sector regulators, exchange data and alert authorities in case of violations. In addition, when needed, it will allow the ministry to hold compliance enforcement drives and automate electronic notices to defaulters.

MCA21 Version 3.0 is expected to be launched and deployed in phases and will include company and LLP modules, e-adjudication, e-consultation, e-book, learning management and compliance management system driven by data analytics, artificial intelligence and machine learning.

India-EU FTA negotiations to resume in June

Financial Express | 26 April 2022

India and the European Union (EU) decided to set up a trade and technology council to boost bilateral ties, as the bloc’s president
India’s merchandise exports cross $400-bn milestone in FY22

Bizz Buzz | 25 April 2022

India’s merchandise exports touched a record $420 billion in FY22. It took the country a decade to incrementally add another $100 billion ($300 billion mark was touched in FY12) as against reaching $200 billion from $100 billion in only 5 years (FY06 to FY11). Emergence of new trade corridor through FTAs/ECTA/CEPA, PLI scheme among others have contributed to this growth, says an internal economic research report by SBI. India’s exports of goods and services (per cent of GDP) which was only 3.7 per cent in 1970 and 6.1 per cent in 1980, reached a peak in 2013 (25.4 per cent) but decelerated thereafter till 2020 (18.7 per cent) mirroring the global trend. The share of service exports in total exports has increased gradually, and significantly from 27 per cent in FY2001 to 41 per cent in FY21, though moderating to 37 per cent in FY22.

Interestingly, the concentration of top 10 countries in our export basket has reduced over the years and share of others have increased, thereby implying diversification of export destinations! Top 15 exports accounted for more than 72 per cent in our total export kitty during Apr-February. “Contrary to popular perception, our estimates show that 55 per cent of the increase in exports in FY22 is attributed to quantity effect and the rest 45 per cent is the price effect, indicating that the growth in exports in FY22 could be sustained if we continue to follow right policies,” says Soumya Kanti Ghosh, SBI group’s chief economic advisor.

As expected, our results show that only 31 per cent of the increase in exports of petroleum crude and products in FY22 can be attributed to higher quantity and rest 69 per cent is because of higher price. In the case of imports, 26 per cent is quantity effect and the rest 74 per cent is the price effect, which is obvious given the elevated level of global commodity/food prices India’s agricultural exports rose remarkably despite Covid-19 and crossed the $50 Billion mark in FY22. However, the large gap in MSP and global prices is likely to incentivise export of wheat from India. This needs to be judiciously balanced with domestic supply of wheat, he added India is following a policy of import rationalisation with China. India imported $5 billion less from China in FY20 vis-a-vis FY19 and further $48 million lower in FY21. However, in FY22 our imports from China increased significantly, reflecting the pandemic induced uncertainties. The share of imports from China has however declined in FY22. Simultaneously, India has been also able to push exports to China and in FY22 it occupies a share of 5.2 per cent of our exports/3rd in terms of ranking of countries.

India is pushing for fresh FTAs and trade concessions with major economies and regional blocs in a bid to boost export-oriented domestic manufacturing as it chases an ambitious export target of $450-500 billion in FY23. The prime objective of an FTA is to facilitate trade by reducing transaction cost and time. It aims to work with state governments to implement ‘District Export Hubs’ that will work towards achieving the export goals of each state.

Australia, UAE Free Trade Agreements: Outreach programme on the cards

Financial Express | 22 April 2022

Weeks after forging trade deals with the UAE and Australia, the government has decided to undertake a nation-wide outreach programme to prepare industry to take advantage of the agreements once they come into force, a senior commerce ministry official told FE.

Over the next few weeks, ministers of state and senior officials of the commerce & industry ministry and state-backed export promotion councils will huddle with senior executives of various companies as well as industry bodies and state government officials in key cities to explain what is in store for them in the two new agreements.

The India-UAE Comprehensive Economic Partnership Agreement will come into force on May 1, while the Economic Cooperation and Trade Agreement with Australia is expected to be in effect after election there in May.

The outreach plan comes amid growing realisation that five of India’s six FTAs (with economies like Asean...
group, Japan, Korea, Singapore and Malaysia), which came into force between 2006 and 2011, only accentuated its trade imbalance with them, partly due to the absence of concerted efforts by the government in sensitising exporters about the opportunities for them by these pacts. Consequently, the utilisation rate of some of these FTAs was less than even 25%.

“We don’t intend to just relax after signing the trade agreements. We want to follow up the efforts already put into making the deals by engaging extensively with our industry to let them know what kind of opportunities are opening up for them via these pacts and how they can cash on them,” said the commerce ministry official.

State government officials and apparatus are also be involved to make the whole exercise more participatory and fruitful, he added. Both India and the UAE are aiming for a bilateral trade (both goods and services) of $100 billion in the next five years from about $60 billion in the pre-pandemic year of FY20.

According to the pact, the UAE will allow as many as 99% of Indian goods (in value term) at zero duty in five years from about 90% in the first year. Similarly, India would allow duty-free access to 80% of goods from the UAE now and it would go up to 90% in ten years. Greater access has also been granted to scores of services under this FTA.

Similarly, India and Australia target to raise their bilateral trade of goods and services to about $50 billion in five years from about $27.5 billion in 2021.

The ECTA promises preferential access to all Indian goods in five years (from 96.4% immediately after the pact comes into effect) and 85% of Australian products (from 70% to start with) to each other’s market.

Indian yoga instructors, chefs, students and STEM (Science, Technology, Engineering and Mathematics) graduates will have easier access to Australia while premium wine from that country will make greater inroads into Indian supermarkets once the ECTA comes into force.

India’s labour-intensive sectors, including textiles & garments, pharmaceuticals, hospitality and gems and jewellery, and other key industries like IT and start-ups are expected to gain from both the pacts.

Govt. likely to set export target of $800 Billion for FY23

The Economic Times | 21 April 2022

India is likely to set an ambitious export target of around $800 billion for goods and services for 2022-23, almost 19.5% higher than $670 billion clocked in 2021-22. The targets - of $450-480 billion for merchandise and $350 billion for services were discussed in a series of meetings that commerce and industry minister Piyush Goyal had with exporters. India’s goods exports touched a record $420 billion in 2021-22, exceeding the government’s target by about 5% and up 40% on-year while services exports touched $250 billion. “These are consultative meetings and the targets are yet to be fixed,” said an official. Exporters raised the issue of high prices of inputs as buyers are now reluctant to raise prices proportionately due to sufficient inventory and lack of demand.

Restoration of the Market Access Initiative scheme for opening of warehouses overseas, easing of visa requirements for inbound tourism and a revised Transport and Marketing Assistance scheme for certain agricultural products in view of the opportunity in farm exports from the Russia-Ukraine crisis were also taken up, according to sources.

GST: Ministers’ panel yet to take a view on rate rationalisation

The Free Press Journal | 19 April 2022

A group of ministers, tasked by the Goods and Services Tax Council to look into rate rationalisation, hasn’t taken a view on the issue yet, an official source said.

The seven-member GoM (Group of Ministers), which is led by Karnataka chief minister Basavaraj S Bommai and includes finance ministers from West Bengal, Kerala Goa, Bihar, Uttar Pradesh and Rajasthan as members, is likely to meet early next month.

The group hasn’t taken up a proposal to raise the lowest or threshold slab under GST to 8 per cent from 5 per cent, said the source who wished not to be identified. Any recommendation of the panel would be placed before the GST Council, headed by Union finance minister Nirmala Sitharaman and including representatives of all states and Union Territories, for a final decision.

No dates for the GST Council meeting have so far been announced but it is likely to meet in the second half of May.

With the inflation rate spiking in recent months, policymakers will take a hard look at any change in GST rates lest it fuels price rise, the source said. The GST has a four-tier structure, consisting of 5 per cent, 12 per cent, 18 per cent and 28 per cent rates. Additionally, there are special rates for some goods such as precious metals. There was a thought in some quarters that the slab of 5 per cent may be broken into 3 per cent and 8 per cent, levying the lower tax rate on essential items. But no view on rate rationalisation has yet been taken by the GoM, let alone the GST Council, the source said.
The call on tinkering with the rates is a political decision and the same will weigh when the GST Council takes a view on it, the source said.

The GST Council -- the highest decision-making body that was set up after more than a dozen central and state taxes such as excise duty and VAT was subsumed into a uniform nationwide levy -- had set up the GoM on rate rationalisation at its September 2021 meeting in Lucknow.

The group was asked to review the exempt goods to expand the tax base, suggest changes to simplify the rate structure and garner the required resources.

**IMF cuts India’s FY23 growth forecast to 8.2% from 9%**

*The Times of India | 20 April 2022*

India’s economy is estimated to grow by 8.2% in the current fiscal year (2022-23), sharply slower than the International Monetary Fund’s (IMF) earlier forecast of 9% as the impact of Russia’s invasion of Ukraine weighs heavily on prices and disruption of supply chains.

In its latest World Economic Outlook (WEO) report, the IMF forecast India’s economy to grow by 6.9% in 2023-24. The latest GDP growth forecast for India is still higher than the Reserve Bank of India’s (RBI) estimate of 7.2% for 2022-23. The central bank had earlier lowered its growth estimate from 7.8%, citing the impact of the war in Ukraine and breakdown of supply chains. The finance ministry had earlier estimated the economy to grow in the 8%-8.5% range in 2022-23.

India, however, will retain its tag as the fastest growing major global economy but it faces severe headwinds.

China is estimated to grow 4.4% in 2022-23 and 5.1% in 2023-24, a downgrade of 0.4 percentage point. The IMF cautioned that slowing growth in China’s economy has wider ramifications for Asia and for commodity exporters. The combination of more transmissible variants and a zero-Covid strategy entails the prospect of more frequent lockdowns, with attendant effects on private consumption in China.

The WEO said that the war in Ukraine will severely setback the global recovery, slowing growth and increasing inflation even further. The report projects global growth at 3.6% in 2022 and 2023 – 0.8 and 0.2 percentage lower than the January forecast, respectively. It said that the downgrade in global growth forecast reflects the war’s direct impact on Russia and Ukraine and global spillovers.

**Exporters receive payment dues in euros from Russia**

*Hindustan Times | 16 April 2022*

Indian exporters to Russia have started receiving stuck payments in euros through banks that are not under Western sanctions, although Moscow and New Delhi are still to prepare an alternative payments mechanism.

Industry estimates suggest that Indian exporters have received nearly $100 million from Russian buyers.

At the beginning of March, nearly $400-500 million worth of export payments to Russia were stuck, according to industry estimates. However, there had been no case of payment defaults, with Russian buyers trying to make payments through alternative routes and keen to buy more. However, despite high demand from Russia, the lack of insurance cover and blocked routes are preventing consignments from getting shipped.

**Govt. to widen crackdown on low-grade imports; Move to hurt Chinese suppliers the most**

*Financial Express | 16 April 2022*

The government is planning to firm up quality specifications for a broader range of imported products, as it intends to harden a crackdown on the inflows of substandard goods from overseas.

Official sources told FE that the Bureau Of Indian Standards (BIS) has convened a meeting on April 20 of officials from several ministries that oversee the trade of various products or develop standards for them.

“The idea is to identify imported products for which standard specifications are yet to be developed or revised,” said one of the sources. “BIS director general Pramod Kumar Tiwari, who will chair the meeting, will also monitor whether enough testing facilities are in place at the district level and whether common testing facilities can be developed for MSME clusters,” he added.

The move goes beyond the government’s initial plan to formulate standards/technical regulations or put in place quality control orders (QCOs) for 371 key products in the first phase. Imports of these 371 products were to the tune of $128 billion, or a fourth of the total purchases from overseas, in FY19, before the Covid outbreak.

The decision isn’t specific to any country but it could hurt China, as Beijing is the biggest supplier of low-grade products to India.

Nevertheless, keeping with the principle of free and fair trade and to ensure domestic consumers have access to quality products, both Indian manufacturers and foreign suppliers will have to conform to the same standard specifications.
Importantly, it will also prompt domestic producers to collectively enhance the quality of their products so that they will be better placed to take advantage of various trade agreements that the government has forged or is planning to conclude with even developed economies. Recently, it sealed a deal with Australia and is planning to get into free trade agreements with the UK, Canada and the EU.

India’s move to develop technical specifications for products in recent years marks a shift in its approach to curb low-grade imports; its earlier approach was to raise tariffs.

Since substandard products are usually imported at much cheaper rates, they not just pose risks to consumer health and environment but also hit domestic manufacturing because of the price competitiveness.

Concerned about protectionism by stealth adopted by some nations, commerce and industry minister Piyush Goyal has been asking industry associations to flag non-tariff barriers faced by Indian exporters in various countries so that New Delhi can firm up appropriate remedial responses.

The dozens of products where quality control orders have been issued include air conditioner, toys, footwears, pressure cooker and microwave. The government has also firmed up standards as well as technical regulations for hundreds of products across sectors, including consumer electronics, steel, heavy machinery, telecom goods, chemicals, pharmaceuticals, paper, rubber articles, glass, industrial machinery, some metal products, furniture, fertiliser, food and textiles.

Analysts have said India seems to have taken a cue from developed and major developing nations that have erected non-tariff barriers to target non-essential and substandard imports. For instance, the US put in place as many as 8,453 non-tariff measures, followed by the EU (3,119), China (2,971), South Korea (1,929) and Japan (1,881), according to a commerce ministry analysis in 2020. In contrast, India had imposed only 504 of them.

Of course, non-tariff measures are not always aimed at curbing imports (for instance, safety, quality and environmental standards are put in place by all countries for imported products). But what have often worried analysts is that they can be abused for trade protectionism.

**Ukraine crisis: WTO slashes world trade growth forecast to 3%**

*Financial Express | 13 April 2022*

The Russia-Ukraine conflict could substantially weigh down global trade growth to 3% in 2022 from 4.7% projected in October 2021, the World Trade Organization (WTO) said. Trade growth could rise to 3.4% in 2023 but will still remain way below the 9.8% recorded in 2021, it added. Any such slowdown could also weigh on demand for Indian merchandise at a time when New Delhi is planning to scale up its goods exports from a record $418 billion in FY22.

Similarly, the Ukraine war will likely weigh down global economic growth by 0.7-1.3 percentage points from the earlier forecasts, bringing growth to somewhere between 3.1% and 3.7% in 2022, the global body said. The projections are based on a global economic simulation model and are part of a report, titled “The Crisis in Ukraine: Implications of the War for Global Trade and Development”.

In the longer term, the WTO said the conflict could even trigger a disintegration of the global economy into separate blocs. India’s real GDP, in such a scenario, would falter by 9% (deviation from a baseline projection), China’s by 7% and Russia’s by as much as 10%, it added.

“In case of a longer-term disintegration of the global economy into two economic blocs (‘decoupling’), global GDP would suffer by about 5% in the long run, with larger losses being incurred by emerging economies,” the WTO said.

Sanctions on Russia, meanwhile, could cause major economies to move towards “decoupling” based on geopolitical considerations, with the aim of achieving greater self-sufficiency in trade and production, the report said. Even if no formal blocs emerge, private players may decide to minimise risk by reorientating supply chains. Of course, the WTO said the simulations “should not be interpreted as forecasts but rather as an attempt to understand the impact the crisis in Ukraine has through different mechanisms”.

Although the share of Russia and Ukraine in total global trade and output are relatively small, these countries are important suppliers of essential products, especially food and energy items.

Both the countries made up 2.5% of world merchandise trade and 1.9% of world GDP in 2021. Yet, they supplied around a quarter of wheat, 15% of barley and 45% of sunflower products exports in 2019, according to the report. The WTO said that some regions like Europe, given its dependence on Russia for energy supply, would be more strongly affected by the war than others.

**Gujarat Tops Niti Aayog’s Index for Energy and Climate, Kerala At 2nd**

*NDTV | 12 April 2022*

Gujarat has topped NITI Aayog’s State Energy and Climate Index (SECI) with a score of 50.1 points in the larger states category. Kerala and Punjab are ranked second and third respectively. While Goa has topped the category of small states, followed by Tripura and Manipur.
According to NITI Aayog, the State Energy and Climate Index is the first index that aims to track the efforts made by states and UTs in the climate and energy sector.

It is hoped that an in-depth analysis of individual states will help in enhancing the service delivery on various parameters of energy. These parameters have been devised keeping in mind India’s goals for climate change and clean energy transition.

State Energy and Climate Index covers affordability, accessibility, efficiency, DISCOM’s performance and climate friendliness of all forms of energy. This index is envisaged to be at par with the international indices covering the entire energy value-chain.

Since DISCOMS are the important link in the entire energy value chain, their performance has been assigned with a higher weightage (40 per cent) in the overall index. The aspects of financial viability and performance of DISCOMS have been taken into consideration to encourage competition among states. Other parameters such as ‘access, affordability and reliability of energy’, ‘clean energy initiatives’, ‘energy efficiency’, ‘environmental sustainability’ and ‘new initiatives’ have been assigned weights of 15 per cent, 15 per cent, 6 per cent, 12 per cent and 12 per cent respectively.

The overall objective of the index is to develop healthy competition among the states to perform better and provide quality energy services to users in their states.

Though Gujarat is the best-performing state, its performance in terms of Environmental Sustainability and New initiatives needs improvement. The SECI score for states such as Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, and Uttar Pradesh was observed within the range of 40-45, said the NITI Aayog report.

India has learnt from past mistakes and got creative in signing FTAs, says DGFT

*Financial Express | 11 April 2022*

Santosh Kumar Sarangi, Director General of Foreign Trade, says once trade normalcy is restored after the Ukraine war, there are ample opportunities for India to raise exports of farm commodities, pharmaceuticals, electronics and iron and steel. In his first interview as the DGFT, Sarangi said that the government has been working to ensure exporters to Russia receive payment for past supplies without violating western sanctions. He stresses India has learnt from its past mistakes and has got more creative now to forge balanced FTAs. He defends India’s import tariffs, saying they are well below the levels allowed by the WTO. Over 57% of exporters’ outstanding claims of Rs 56,027 crore until FY21, under various export promotion schemes, were settled in FY22 alone and the rest will be taken up in FY23; this has improved their liquidity. The next foreign exchange policy will focus more on ease of exports and enable e-commerce players, small-time exporters and farmers to jump on the export bandwagon.

India, Australia target $100 billion trade by 2030

*Hindustan Times | 07 April 2022*

India and Australia can potentially take their bilateral trade from $27.5 billion to $100 billion in eight years, the trade ministers of the two countries said, days after the two sides struck an interim trade deal that has significant implications for the economies of both countries as well as geopolitical alignments, particularly in the context of checking China.

The interim free trade agreement, among eight such big ticket partnerships India is working on with countries such as the UK, the European Union nations, Israel and Canada, will pave the way for both sides to boost exports and ease rules for tourists and working professionals.

Addressing Australian businesses in Melbourne, commerce minister Piyush Goyal said: “The two economies are not competing, but complementing each other. Sector by sector analysis show that $100 billion trade [in goods and services] can be achieved by 2030.”

Australian trade minister Dan Tehan said that the target is achievable since the two partners are negotiating a more comprehensive agreement in various areas, including sports and dual degrees programmes for students pursuing special courses in streams such as science and technology.

Friction between Australia’s government and Beijing has brought a series of official and unofficial Chinese trade sanctions on Australian exports including coal, beef, seafood, wine and barley. Meanwhile, India has been looking to boost exports, including by offering countries an alternative to China.

Both ministers said that after signing the India-Australia Economic Cooperation and Trade Agreement (Ind-Aus ECTA), they are now considering to expand its scope in areas where greater cooperation is possible.

India and Australia on April 2 signed a comprehensive, but interim free-trade agreement that provides zero duty exports to 100% tariff lines from India to the Australian market, benefiting labour-intensive sectors besides providing greater access to services space through liberalised visa norms for students and professionals, including quota for Indian chefs and yoga teachers. Australia will be able to supply various raw materials and intermediaries at zero duty.
Asia’s Largest Sewerage Treatment Plant at Okhla to Open This December, Set to Play Major Role in Yamuna Cleaning Process

Swaraja | 06 April 2022

Jal Shakti Minister Gajendra Singh Shekhawat inspected the under-construction 564 Million Litres Per Day (MLD) Okhla Sewerage Treatment Plant, which is expected to play a major role in the Yamuna cleaning process.

The plant, which will be the largest one in Asia, aims to remove contaminants from sewage to produce an effluent that is suitable for discharge to the surrounding environment or an intended reuse application, thereby preventing water pollution.

National Mission for Clean Ganga (NMCG) Director General G Asok Kumar said that the Okhla plant would be playing a major role in Yamuna cleaning process once it becomes operational.

According to the cost sharing arrangement, 85 per cent of the cost is borne by the central government under the Namami Gange Programme and 15 per cent by the state government. The total sanction cost of the Okhla STP project is Rs. 665.78 crore, the ministry said in a statement.

Shekhawat said that considering the situation in Delhi, it has been directed to expedite the STP works in Delhi, keeping in mind the December 2022 timeline. He added that after December 2022, a difference will certainly be felt in the quality of water in Yamuna river in Delhi as the Okhla STP is the biggest sewage treatment plant in Asia.

Under the Namami Gange programme, a total of 11 projects for treatment of 1268 MLD sewage have been taken up at a cost of Rs 2099 crore by NMCG to conserve River Yamuna in Delhi. The major share of these projects is being borne by the Central Government through the Namami Gange Programme. These projects are targeted to create a total treatment capacity of 1268 MLD in the catchment area of Coronation Pillar (Coronation Pillar STP completed), Kondli, Okhla and Rithala in Delhi. These projects are targeted to be completed by December 2022.

‘India’s energy transition to create 3.2 million jobs by 2050’

Chemical Weekly | 05 April 2022

Union Minister of State for New & Renewable Energy, Mr. Bhagwanth Khuba has stated that the energy transition that India is undertaking has the potential to create 3.2 million jobs by 2050. Speaking at a curtain raiser for a conference on making India a global manufacturing hub for renewable energy organised by CII, Mr. Khuba said that the transition will help reduce the dependence on imported fuels, which will improve the country’s trade balance and cut greenhouse gas (GHG) emissions. According to the minister, economic growth, increasing prosperity, a growing rate of urbanisation and rising per capita energy consumption are the key contributors to increasing demand for energy in the country. The Ambassador of Brazil to India, Mr. Andre Aranha Correa do Lago stated that Brazil looks to India as a potential manufacturing partner for solar panels, as it aims to install 52-GW of solar. He also suggested that India reap the benefits of the Brazilian experience with ethanol fuel to build and boost its own industry.

IPCC calls for ‘immediate and deep’ cuts in emissions to save the planet

Business Line | 05 April 2022

A report of the Intergovernmental Panel on Climate Change (IPCC) has called for “immediate and deep emission reductions across all sectors” in order to limit the rise in global warming to 1.5 degrees above pre-industrial levels (1850-1900).

The report was that of the Working Group III — dealing with ‘mitigation’ — refers to measures to be taken to prevent further global warming. The previous reports of Working Groups I and II — released last year and earlier this year — dealt with ‘physical science basis’ for climate action and ‘adaptation’, referring to the measures that are to be taken to cope up with inevitable climate change effects.

These three form part of IPCC’s 6th Assessment Report, or the 6th round of assessment.

Stressing on the urgency of emission reductions, the report noted that to meet the 1.5 degrees target, net CO2 emissions should be zero by the early 2050s. Even if the target is only 2 degrees C, global greenhouse gas emissions should not rise after 2025 (they must start falling) at the latest, and must be reduced by a quarter by 2030.

It is not as though there has been no action. The report notes that since 2010, “There have been sustained decreases of up to 85 per cent in the costs of solar and wind energy, and batteries. An increasing range of policies and laws have enhanced energy efficiency, reduced rates of deforestation and accelerated the deployment of renewable energy.”

IPCC report may spell death knell for coal-based units

The Hindu | 05 April 2022

A consortium of scientists as part of the UN’s Intergovernmental Panel on Climate Change (IPCC) said that all coal-fired power plants, without the technology to capture and store carbon (CCS), need to be shuttered.
by 2050 if the world aspired to limit global temperature rise to 1.5 degrees Celsius. These scientists were part of the Working Group 3, or those with expertise to analyse how best the impact of greenhouse gas emissions could be mitigated.

According to the Central Electricity Authority, India has about 211 GW of operational coal-fired power plants — roughly 10% of global capacity. As per Global Energy Monitor data, another 31 GW was being constructed and about 24 GW in various pre-construction phases. None of the existing under construction coal-fired power plants in India have CCS facilities.

“But having the right policies, infrastructure and technology in place to enable changes to our lifestyles and behaviour can result in a 70% reduction in greenhouse gas emissions by 2050.

This offers significant untapped potential,” IPCC Working Group III Co-Chair Priyadarshi Shukla said in a statement, “The evidence also shows that these lifestyle changes can improve our health and well-being.”

The Summary for Policymakers of the IPCC Working Group III report, as the document is known, was approved by 195 member-governments of the IPCC, through a virtual approval session that started on March 21. It is the third instalment of the IPCC’s Sixth Assessment Report (AR6), which will be completed this year.

In the scenarios by the scientists, limiting warming to around 1.5 degrees Celsius requires global greenhouse gas emissions to peak before 2025 at the latest and be reduced by 43% by 2030; at the same time, methane would also need to be reduced by about a third. Even if this happened, it was almost inevitable that this ceiling would be temporarily breached but, with appropriate action, it could again dip down by the end of the century.

Exports rise 40% to touch $418 bn in FY22, surpass govt target by 5%

Business Standard | 04 April 2022

The value of goods exported from India witnessed a 40 per cent growth during the financial year 2021-22, hitting a record $417.8 billion and surpassing the target set by the government by 5 per cent, according to the commerce and industry ministry.

During the month of March, exports touched $40.38 billion, as compared to $34 billion during the same period a year earlier. The growth was driven by higher demand for items in the petroleum, gems and jewellery, engineering products.

“India has exported $418 billion, for the first time in its history. This is more than the set target. Exceed $40 billion in exports in March alone which is the history of highest export in a single month,” commerce and industry minister Piyush Goyal told reporters.

“We have been able to achieve such wonderful results without any specific subsidies and grants and that is the way to go…You can handhold up to a level, but ultimately we have to stand on our own feet, we have to engage with the world from a position of strength, with self confidence, with the basis of our confidence and high quality and that is reflected in our achievement today,” Goyal said.

While the government is yet to release the import data for the month of March, it is expected that inbound shipments will also touch record high. Imports grew 51 per cent on year to $589 billion during 1 April 2021-21 March 2022, resulting in widening of the trade deficit to $189 billion. Considering these numbers, India’s total trade, in a first, is set to exceed $1 trillion.

Director General of Foreign Trade (DGFT) Santosh Sarangi told reporters that India’s export basket is not confined to intermediate goods or raw materials, but is gradually moving towards manufactured goods. “Our engineering and electronics goods export indicates this,” Sarangi said.

Sarangi further said that India has seen a significant jump in exports to developed markets as well such as the United States, Netherlands, Singapore, Hong Kong, United Kingdom, Belgium, Germany. On the contrary, till now substantial amounts of goods were exported to neighbouring countries, predominantly to the Association of Southeast Asian Nations (ASEAN).

A BIMSTEC FTA will realise the full potential of the Bay of Bengal grouping

Financial Express | 04 April 2022

The ruling NDA regime has of late revamped its strategy for free trade agreements largely due to the compulsions of boosting exports as an engine of growth. After not signing any major FTA in the last 10 years, India inked a Comprehensive Economic Partnership Agreement with UAE, besides an economic cooperation and trade agreement with Australia to be followed by a flurry of other deals.

The big question is after the fifth summit of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), how long will it take to flesh out an FTA of this grouping — comprising India, Bangladesh, Myanmar, Thailand, Bhutan, Nepal and Sri Lanka — that is a bridge between South Asia and Southeast Asia?

A BIMSTEC FTA no doubt will undergird economic integration and prosperity of this regional grouping. Interestingly, five of its members are also part of the South Asian Association for Regional Cooperation (SAARC), while Myanmar and
Thailand are part of the Association of South East Asian Nations (ASEAN) and Regional Comprehensive Economic Partnership (RCEP). SAARC is a failed effort at regional integration due to India’s problems with Pakistan. India walked out of RCEP and is reviewing its FTA with ASEAN largely due to its concerns regarding China dumping its goods through other markets. The BIMSTEC FTA in the making thus will have to be sensitive to India’s concerns, especially on strict rules of origin of goods.

BIMSTEC’s diversity, however, is also a potential advantage as it serves as a bridge to RCEP, should India choose to rejoin later on. If BIMSTEC is to succeed where SAARC failed, India must draw the right lessons as the trade pact is being finalised. Besides India-Pakistan tensions, the process of South Asian integration proved to be difficult because the other member countries felt a resentment towards India’s dominance. Ensuring greater market access through unilateral trade liberalisation would have made a big difference and SAARC members would then have benefited from India’s rise as an economic power. Their resentment has only deepened as every member only registered trade deficits with India year after year. As India is also dominant within BIMSTEC, accounting for the bulk of its combined GDP of $4 trillion and population, an FTA will take off when its members develop a larger stake in India’s robust growth story. To defend its turf in South Asia, India must reduce its trade surplus by allowing BIMSTEC members to export all they can to its domestic market.

A BIMSTEC FTA, however, is an idea whose time has come as all the building blocks are in place. The 21st meeting of the BIMSTEC trade negotiating committee held in Dhaka four years ago made progress in finalising draft texts of trade in goods, agreement on cooperation and mutual assistance in customs matters and agreement on dispute settlement procedures. In January, Bangladesh hosted a working group meeting to flesh out rules of origin of goods. Implementing an FTA at the earliest will realise the full potential of the Bay of Bengal grouping.

India’s GDP can grow to $40 trillion if working-age population gets employment: CII Report

The Hindu | 03 April 2022

India’s Gross Domestic Product (GDP) can grow from the current $3 trillion to $9 trillion by 2030, and $40 trillion by 2047, if the country’s working-age population — which is expected to increase by over 100 million people between 2020-30, is productively employed, according to a report by the Confederation of Indian Industry (CII).

The report also cautioned that if India does not create enough jobs and its workers are not adequately prepared for those jobs, its demographic dividend may turn into a liability. This, it added, can be done on a sustained basis only with changes in its policy frameworks for education and workforce management.

“The reversal in India’s structural transformation back toward agriculture is a sign of fall back to subsistence employment. Enhanced safety nets through PM-KISAN and the MGNREGA will be critical investments needed to ensure that incomes of small and marginal farmers are protected and their basic needs are met… But manufacturing and services will still have to be the two key growth engines going forward,” it said.

Russia offers to pay Indian suppliers in euro or dollar

Financial Express | 02 April 2022

Sanctions-hit Russia has offered to pay Indian exporters in the euro or the dollar, as Moscow has adequate reserves of these currencies. However, India hasn’t yet made up its mind on receiving such payments, as it would be difficult for it to ensure conversion of these currencies into rupee without upsetting key western nations that have been asking New Delhi to condemn Moscow’s invasion of Ukraine.

Separately, Russian foreign minister Sergei Lavrov, who is on a visit to India, said the two countries would use a rupee-ruble mechanism to trade oil, defence equipment and growth, even as the developed world including China ages,” the report notes.

The report adds that over the years, India has experienced rising literacy rates, but level of vocational training/ skilling is low, which gets reflected in the high unemployment rate among the educated. “Closing the skill gaps of its qualified workforce will be critical, as India depends more on human capital than its peer countries that have a similar level of economic development,” it said, adding that skilling and reskilling require a coordinated response from the government, industry, academia even as COVID continues to cause structural changes to the workplace.

“The reversal in India’s structural transformation back toward agriculture is a sign of fall back to subsistence employment. Enhanced safety nets through PM-KISAN and the MGNREGA will be critical investments needed to ensure that incomes of small and marginal farmers are protected and their basic needs are met… But manufacturing and services will still have to be the two key growth engines going forward,” it said.
other goods.

“I have no doubt that a way would be (found) to bypass the artificial impediments which illegal unilateral sanctions by the West create. This relates also to the area of military-technical cooperation,” Lavrov said. Russia’s offer to pay in the dollar or euro precedes Lavrov’s visit and still stands, said one of the sources.

Some Indian exporters have claimed that $400-600 million in payment is stuck, although there is no official word on it. “The issue is that of conversion,” one of the sources said.

For instance, if the settlement for a Russian dollar payment takes place in New York through the Clearing House Interbank Payments System, which is a large private sector dollar clearing system, it will potentially draw the US ire.

Already, following Russia’s attack on Ukraine, the US and its European allies decided to block certain Russian banks from the SWIFT financial-messaging infrastructure for cross-border payment. VTB, Russia’s second-largest bank by assets, VEB, another big player, and five smaller ones have been cut off from the SWIFT. This has adversely affected trade transactions with Russia. While transactions can still happen through the Russian banks that are not under sanctions yet, foreign banks are not willing to deal with them in a big way.

Moscow has also offered New Delhi rupee-rouble trade using Russia’s messaging system SPFS, trade sources said. However, any such move could put India in a spot.

New Delhi buys substantially more goods from Moscow than what it ships out to the latter (its bilateral trade deficit stood at $4.34 billion in the first three quarters of FY22). So, payments shouldn’t be an issue, if a proper rupee-rouble architecture is worked out, exporters said.

According to exporters, to operationalise this mechanism, the government has to nominate banks that will anchor the payments. For instance, Uco Bank facilitated payments to exporters, via the rupee-rouble regime, for supplying to sanctions-hit Iran. However, operationalising such a framework is much easier said than done in the current context. So, the government may choose to wait it out until situation in Ukraine shows some sign of normalcy.

India mostly buys petroleum products, diamonds and other precious stones and fertilisers from Russia. Similarly, it ships out capital goods, pharmaceutical products, organic chemicals and farm products to Moscow. Capital goods and certain consumer products made up 25% of India’s exports to Russia in the first three quarters of this fiscal, while pharmaceutical and organic chemicals accounted for over 22% and farm items 18%.

**Interim trade deal today: Over 95% of Indian goods to get duty-free access to Australia**

*Financial Express | 02 April 2022*

More than 95% of roughly 12,000 Indian goods will get duty-free access to the Australian market as New Delhi signs a much-awaited trade deal with Canberra. India will keep its sensitive dairy sector out of the ambit of the interim pact, but will allow premium Australian wine at concessional duties, official sources said.

Of course, the scope of the pact will be expanded to cover 100% Indian goods in five years. About 70% of Australian products will get duty-free and concessional access to the Indian market under the Economic Co-operation and Trade Agreement, as the deal will be formally known. This will be increased to cover 85% of goods in 10 years.

Indian exporters in critical sectors, especially labour-intensive ones like agriculture, textiles & garments and pharmaceuticals will get duty-free access to the Australian market. New Delhi will also get greater access in about 100 services. Importantly, the deal will also ensure freer movement of skilled professionals from India under the so-called Mode-4 services. Both the sides will forge a broader free trade agreement (FTA) in due course to build on this partnership.

The deal will be signed by commerce and industry minister Piyush Goyal and his Australian counterpart in the presence (virtual) of Prime Ministers Narendra Modi and Scott Morrison. The basic customs duty on premium Australian wine (beyond a price threshold) will be cut in phases — from the current 150% to 100% and then to 75%. This is designed to protect the Indian wine industry that doesn’t typically operate in that high-end segment. Public procurement isn’t part of the deal yet. At just $8.6 million, spirits and beverages, including wine, accounted for a tiny slice of Australia’s exports to India until January last fiscal, thanks to the prohibitive impost.

This deal goes beyond the realm of trade, as it covers strategic considerations as well, said a senior government official. Both the countries are part of the strategically-important QUAD grouping along with the US and Japan. Similarly, together with Japan, they form a supply-chain resilience initiative, a move that is seen as countering China’s “weaponisation” of supply chains.

**Govt defers labour codes as states fail to finalise rules**

*The Times of India | 01 April 2022*

The Centre has deferred the implementation of the four labour codes, originally due on April 1, as several state governments have still
not finalised the relevant rules, giving more time to companies to realign their salary structures in line with the new legal provisions.

The delay, however, will adversely impact migrant workers and gig workers, including workers engaged with platforms like Ola and Uber, who will now have to wait longer to receive benefits that were to flow to them under the new law.

Since labour is a concurrent subject under the Constitution, both the Centre and states are required to notify rules under the codes to enforce the law in their respective geographies.

Although the ministry had earlier said implementation of the central laws will not be contingent on states making their rules, a senior government functionary said, “We would like to have some major states ready at least.”

Key states such as UP, Bihar, Madhya Pradesh, Haryana and Uttarakhand have only circulated the draft rules for two codes, while Karnataka has circulated draft rules for one code. Jammu and Kashmir is the only state that has finalised its rules so far.

The labour ministry had planned to implement the four labour codes — on industrial relations, wages, social security and occupational health safety and working conditions — from April 1.

The ministry has also finalised the rules under the four codes. Government sources said there is not clarity as yet on when the codes may now be implemented, since it is now contingent on getting at least a few major states on board.

Putting off the implementation of the code on wages, which is among the four new laws awaiting enforcement, will give companies a temporary breather from making changes to employees’ takehome salaries or their provident fund liabilities.

The new code caps allowances at 50% of an employee’s basic income and provides for provident fund contribution as a prescribed proportion of 50% of gross pay. The new law, experts said, are expected to increase employee costs for companies.

Chemicals and Petrochemicals

Exports of Indian chemicals Registers Excellent Growth

Chemical Industry Digest | 30 April 2022

Chemical exports from India reached a new high of $29,296 million in 2021-22, up from $14,210 million in 2013-14, a 106 percent rise. Union Minister for Commerce and Industry Piyush Goyal mentions that the increase in exports would help in India’s “Aatmanirbhar Bharat Abhiyan.”

A surge in shipments of organic, inorganic, agrochemicals, dyes and dye intermediates, and specialty chemicals has resulted in an increase in chemical exports. With the ‘Make in India’ concept, the Indian chemical sector has grown into a global player that earns foreign cash for the country. India is the world’s sixth largest chemical producer and Asia’s third.

In terms of chemical exports, India is ranked 14th.

India now leads the world in dye production, accounting for sixteen percent to eighteen percent of global dyestuff exports. Indian dye is sold in more than ninety countries. India is the world’s fourth largest producer of agrochemicals, producing more than half of all technical pesticides. India exports about half of all agrochemicals to the rest of the world. India is the world’s largest producer and exporter of castor oil, accounting for over 85-90 percent of total global exports in this sector.

India exports to around 175 countries, with the United States, China, and Turkey, Russia, and North-East Asian countries (China, Hong Kong, Japan, Korea Republic, Taiwan, Macao, Mongolia) being added as new markets.

CHEMEXCIL has also taken a number of initiatives, including using grant in aid under the market access initiative scheme, organising B2B exhibitions in various countries, exploring new potential markets through product-specific and marketing campaigns with the active participation of Indian embassies, and providing financial assistance in statutory compliance in overseas product registration, among other things.

Despite significant logistical hurdles such as high freight costs and container constraints, this export growth has been achieved. Small and medium exporters from Gujarat, Maharashtra, Karnataka, Tamil Nadu, and Andhra Pradesh have benefited from a surge in chemical product exports. Over time, the industry has modernised through new molecules, technological breakthroughs, product profile, and quality to become a modern world-class chemical industry capable of competing globally.

Chlorinated water: Know about the benefits and risks

The Indian Express | 28 April 2022

The National Disaster Management Authority (NDMA) recommends consuming boiled or chlorinated water to prevent water-related illnesses. In a Twitter thread, NDMA mentioned that according to the Health Department, chlorination can be
considered as an alternative to boiling water, albeit with riders.

“Chlorination is a purification technique for safe drinking water. It is recommended by the Department of Health amidst possible contamination during calamities,” the post read.

Chlorination means adding chlorine to drinking water in order to kill parasites, bacteria, and viruses that cause illnesses. “Chlorination is the most common type of drinking water disinfection done to avoid waterborne diseases (like cholera, typhoid, and dysentery) and the mortality caused due to them,” explained Dr Vikrant Shah, consulting physician, intensivist, and infection disease specialist, Zen Multispeciality Hospital Chembur.

Here’s how to purify water with chlorination, according to NDMA

Filter out large impurities using a clean piece of cloth or a coffee filter. Ensure the container is clean.

Chlorinate by adding two drops of unscented bleach for every litre of water. Use five per cent chlorine solution.

Smell the water after one hour. A faint chlorine smell should indicate success.

However, Dr Shah stresses that while chlorination is one of the most common disinfectant practices with levels up to four milligrams per liter (mg/L or 4 parts per million (ppm)) considered safe in drinking water, it is best to limit its use for better health.

“Chlorine contains toxins, such as trihalomethanes (THMs) that can lead to asthma, bladder cancer, and heart disease. Even if chlorine levels in drinking water are found to be safe, the chlorine can cause a bad taste or smell discouraging you from drinking that water. It is best to take the help of an expert and only add the permissible limit of chlorine to drinking water under unusual circumstances like calamities. Unmonitored use of chlorine, when it comes to drinking water, is not recommended at all,” he said.

**Reliance and TA’ZIZ sign shareholder agreement for $2bn Ruwais chemicals project**

*Business Standard | 27 April 2022*

Reliance Industries (RIL) and the Abu Dhabi Chemicals Derivatives Company RSC (TA’ZIZ) on Tuesday signed a shareholder agreement for a chemical project in Ruwais, Abu Dhabi.

The development acquires significance as it will focus on chlor-alkali, ethylene dichloride (EDC) and polyvinyl chloride (PVC) production, which is used in a wide range of industrial applications. This is expected to unlock new revenue streams for RIL as well as the Abu Dhabi National Oil Company (ADNOC) and ADQ, an Abu Dhabi-based investment and holding company, who are strategic partners in TA’ZIZ, a joint venture company.

For the uninitiated, RIL derives over 60 per cent of its revenue and nearly 55 per cent of its operating profit from its oil-to-chemicals (O2C) business. This includes refining, petrochemicals and fuel retail. Retail and telecom, on the other hand, contribute 29 per cent and 17 per cent each to revenue, respectively, said analysts tracking RIL.

The investment in the TA’ZIZ chemical project is estimated at over $2 billion, though RIL clarified that the final investment decision was expected later this year and was subject to regulatory approvals.

Chlor-alkali enables the production of caustic soda, crucial to the alumina refining process. While EDC is used in the production of PVC, which is used to manufacture a wide range of products including pipes, windows fittings, cables, films and flooring.

RIL said that a formal shareholder agreement was signed by senior executives during a visit of Ambani, who is chairman and managing director (MD) of RIL, to the ADNOC headquarters.

The company said that Sultan Al Jaber, Minister of Industry and Advanced Technology and ADNOC MD and Group CEO exchanged a signed framework agreement with RIL for the exploration, development and production of conventional and unconventional resources in Abu Dhabi as well as in decarbonisation of operations.

Experts said that the TA’ZIZ project would benefit from the free trade agreement between India and the United Arab Emirates (UAE), which was signed in February this year. Chemicals was a priority sector for the UAE, with RIL considering investing in more such projects.

“This joint venture is a testimony to the strong and growing ties between India and the UAE and will be a benchmark for more such projects built on the strengths of the two nations. I am looking forward to implementation of the project at an accelerated pace, taking a step further in enhancing the lives of our people in the region,” Ambani said.

**Chemical MSMEs to log robust growth, margins stressed: CRISIL SME Tracker**

*Business Standard | 26 April 2022*

CRISIL Research projects the chemical industry’s revenue to rise 14-17 per cent year-on-year (YoY) in the current fiscal year (FY23), driven by better performance by specialty chemicals, followed by polymers and agrochemicals. Micro, small and
medium enterprises (MSMEs) in the chemical industry are projected to grow 12-15 per cent.

MSMEs’ profitability margins are likely to be more constrained than those of large players, owing to rising material cost, higher working capital requirements, escalated freight cost and limited ability to pass on higher costs to customers. Making up 28-30 per cent of the sector, MSMEs mainly cater to dyes and pigments, agrochemicals and certain niche specialty chemicals.

MSMEs’ double-digit revenue growth will be powered by improved price realisation.

The specialty chemical segment is expected to see better growth than polymers and agrochemicals due to growth in end-use sectors such as textile, real estate, construction and packaged foods. India’s exports are driven by changes at the global level, with a focus on the “China plus one” strategy, and environmental norms introduced by the Chinese government as well as the European Union.

Raw material and fuel costs form a major part of MSMEs’ cost structure in the chemical industry. In FY22, raw material and fuel costs rose 12-15 per cent YoY on average (see chart), but the cost pass-through to customers was limited. To counter the continued inflationary environment and preserve margins this fiscal, MSMEs are steering towards lean inventory management and renewal of new contracts on an ex-factory basis, to avoid the impact of fluctuating freight cost and higher working capital requirements.

The global geopolitical situation and the resultant inflationary environment, especially for crude oil and other key commodities, will be the main monitorable in FY23.

**DCPC sets up ‘Industry Facilitation Cell’ to address industry issues**

*Chemical Weekly | 26 April 2022*

The Ministry of Chemicals & Fertilizers, Department of Chemicals & Petrochemicals (DCPC), Government of India has said that it is setting up an Industry Facilitation Cell (IFC) at the DCPC. The objective of setting up the IFC is to maintain continuous and transparent interaction with industry and an early resolution of issues faced by the industry. The DCPC has appointed two nodal officers on IFC: Dr. Vishal Choudhary (for chemicals) and Mr. Varun Singh Poonia (for petrochemicals).

**Chemical prices up, lockdown in China hampers imports**

*The Times of India | 21 April 2022*

In a setback for the industrial chemical importers and traders, the rates of chemicals of different types have skyrocketed since the Ukraine war started. In further addition to their woes, the import of chemicals from China, which now has become the main source, is going to witness a decline due to the lockdown on account of spurt in the cases of coronavirus. Besides the traders and importers, the factory owners who are consumers of these chemicals are also facing setback as their cost of production has increased and now with short supply, their production and sales are also going to suffer.

Chanmeet Singh, prominent importer of chemicals from the city, said, “Ever since the Ukraine war has started, the rates of chemicals have skyrocketed as supplies from the European countries have stopped and now we are totally dependent on China. Due to huge demand, the Chinese companies and exporters have increased the rates of the chemicals by quite a lot during last more than one month. The rate of sodium hydrosulphite, which was earlier available for Rs. 150 per kilogram, has now rose to Rs. 195. Similarly, the 50 kilogram bag of caustic soda has increased to Rs. 3600 which a month back was Rs. 3000. The price of sodium nitrate bags have also shot up to Rs. 6,800 from Rs. 5,700”

Singh also added, “With such huge increase our investment has increased manifold and we are forced to give advance payment to our suppliers in China as they have changed their terms and conditions. If this was not enough, lockdown has started in China and due to this development, the supply of the chemicals has already started getting affected. We are anticipating there will be huge shortage of the chemicals in coming days”

According to Nirmal Singh, manager of chemical trading company, “Our business has already been jeopardised due to the Ukraine war as rates of the chemicals like titanium dioxide which was Rs. 310-320 per kilogram is now available for Rs. 390 per kilogram and similarly 50 kilogram bag of Soda Ash which was available for Rs. 1900 earlier has now risen to Rs. 2,500 per bag. The other major issue which we are facing right now is the short supply of the chemicals from China due to lockdowns there.”

**Indian Plastics Industry eyes $25 bn exports by 2025**

*The Free Press Journal Chemical Weekly | 20 April 2022*

Piyush Goyal, Union Minister of Commerce & Industry, Consumer Affairs, Food & Public Distribution and Textiles appealed to the Indian plastic industry to set a target to become a Rs 10 lakh-crore industry in the near
future by expanding the domestic and export markets and also by following import substitution.

He was speaking while felicitating exporters at Exports Excellence Awards organised in Mumbai by PLEXCONCIL, India’s apex trade body of plastics exporters.

“India’s plastics industry’s economic activity is worth Rs 3 Lakh crore annually, out of which one-third is exported. There is a significant growth potential for the Indian plastic industry to become the world’s premium supply hub. It can target to take its economic activity to Rs 10 Lakh - crore industries. This could be achieved through more exports and import substitution, which in turn will create immense job opportunities,” said Shri Piyush Goyal while inaugurating and addressing the members of PLEXCONCIL.

Goyal appreciated the Indian plastics industry for its performance on the exports front, as the industry achieved exports of $13 billion in 2021-22 with a growth of 30 percent and lauded the export target of $25 billion in 2021-22 with a 30 per cent achieving $13 billion of exports in the year 2022.

He maintained that the Central Government was supporting the plastic manufacturers, particularly to ensure that more MSMEs should take the advantage of national and global market opportunities and provide more job opportunities to marginalised sector.

In his welcome address, Shri Arvind Goenka said, “The Indian plastics industry is aggressively progressing on national and exports fronts by achieving $13 billion of exports in the year 2021-22 with a 30 per cent growth and eying for $25 billion of exports by 2025, which will take India into the prime spot in global plastics exports.

Sribash Dasmohapatra, Executive Director, PLEXCONCIL, said, “On the exports front, currently, the Indian plastics industry is targeting traditional markets of North America and Europe and also the emerging markets like Africa, Latin America and the Caribbean, and Oceania countries.

“With adequate impetus from the Government, the Indian lastics industry is transforming from a linear to a circular economy benefiting all the stakeholders,” added Goenka.

Effluent treatment gets costlier for industries in Ahmedabad

The Times of IndiaChemical Weekly | 16 April 2022

The increases in prices of raw materials are not only affecting the production activities in the industries, but also the treatment of effluent water. Major Common Effluent Treatment Plants (CETPs) have increased water treatment charges recently.

Three major industrial hubs in Ahmedabad -- Vatva, Naroda and Narol -- have seen effluent water treatment charges increase due to new technologies or raw material price hike. Chemicals and textiles units have seen production costs go up on one hand while on the other, high water treatment charges are also making the situation tough for them in terms of competitiveness. Industries based in Vatva are the hardest hit.

The Green Environment Services Co-op Society Ltd, Vatva, has started using Fenton Catalytic Reactor technology for treatment of industrial effluents and increased the treatment charges. “This is one of the best technologies available for effluent water treatment. However, it has also increased the cost of treating effluent water. Earlier, we charged Rs 40,000 per 25,000 litres based on a certain COD value in water; this has now increased to Rs 80,000,” said Yogesh Parikh, head of the technical committee of the Vatva Green Environment Services Society.

Mandatory BIS licence to make PVC pipes: Gujarat high court notice to Centre

The Times of IndiaChemical Weekly | 16 April 2022

The Gujarat high court issued notices to the Centre through the ministries of environment, forests and climate change and consumer affairs, the Bureau of Indian Standards (BIS) and the Central Pollution Control Board, after PVC pipe manufacturers demanded the quashing of certain provisions of the Lead Stabilizer in Polyvinyl Chloride Pipes and Fitting Rules, 2021, terming them unconstitutional.

The Saurashtra Plastics Manufacturers Association filed the petition through advocate Pratik Jasani, challenging rules that mandate that PVC pipe manufacturers get a licence from the BIS to make PVC pipes and that they must have an ISI standard mark on them. The petitioners want Rule 2 of the 2021 Rules to be quashed because it exceeds jurisdiction conferred under Section 3 of the Environment Protection Act.

The petition contends that the requirement of a licence from BIS for PVC pipes and fittings is illegal and arbitrary and should be set aside. The petition explains how various types of PVC pipes are manufactured and says it is impossible to have a licence from the BIS and to then obtain a standard mark.

The association also expressed concerns at the feasibility of following the new rules mandating a certificate and standard mark by local manufacturers, especially for those who operate on small and medium scale. The petition claims that while
they have been made to follow this, those who import PVC pipes have been exempted and only need to send samples for testing. This differential treatment may lead to the elimination of small and medium-sized plastic manufacturers in competition with large-scale manufacturers and importers.

The petition also highlighted that the requirement of BIS certification in this process stresses on the durability of a product and has nothing to do with environmental issues, whereas the National Green Tribunal in an order in 2017 imposed certain restrictions in this regard.

After seeking a reply from the authorities concerned, the bench of Justice R M Chhaya and Justice H M Prachchhak posted a further hearing for June 13.

Ciech S A: Siemens creates a soda production line simulator for the CIECH Group; the goal is to increase the efficiency of the production process

The New Indian Express | 12 April 2022

The CIECH Group, the second largest European producer of sodium carbonate (soda ash) and sodium bicarbonate (baking soda), and Siemens, a global leader in digitisation of industrial production, are working together to create a complete soda production line simulator in order to improve the efficiency of the production process of this raw material. Specialised software is a valuable tool used by the CIECH’s production technologists and R&D Department. It enables you to simulate changes in the operating parameters of the production line. The simulator is being constructed at the factory in Inowroclaw, in combination with the “Advanced Process Control” technology implemented there.

- Creating software that fully reflects the production of soda ash enables our technologists to look for ways to increase the efficiency of this process. In the next step, it will enable the creation of a training simulator for employees who are production operators. Thanks to this, they will be able to train in the operation of the production line and gain the qualifications necessary to manage the soda production process faster - says Mirosław Skowron, Member of the Management Board of CIECH S.A.

Currently, the process of training production operators takes up to two years, and with the use of the new training simulator in the future, it can be significantly shortened.

Digitisation and the use of innovative technological solutions to improve production efficiency are the key elements of the CIECH Groups business strategy. Accordingly, since 2019, together with Siemens, CIECH has been working on the creation of a complete simulator of the soda production line. This specialised software also takes into account the functioning and operating parameters of the heat and power plant, supplying the installation with high-pressure steam - a key raw material in the production of soda. The simulator developed by Siemens, with the participation of CIECH’s specialists, allows for effective testing of changes in parameters, both chemical and physical, in the soda production process.

The application of the Siemens gPROMS software at the Inowroclaw plant made it possible to create a Digital Twin of the installation. This model recreates the operation of the entire production plant, which consists of 266 unit operations reflected by 240 thousand equations describing physicochemical phenomena and 460 partial differential equations describing the dynamics of the mass and energy balance.

- The expected profitability threshold of this investment is to be reached after 6 months. The expected result of the use of simulation tools is a more efficient use of raw materials and semi-finished products in production. The implemented tool enables, among others, carrying out analyses of the balance of carbon dioxide, one of the key gases used in the production of soda. It is also expected to recover media within the process installation more efficiently - says Szymon Paprocki, Process Automation Director at Siemens Polska.

The Optimisation function is an important feature of the Digital Twin used to simulate the processes in the Inowroclaw plant. It enables you to make simulations for previously set parameters. An example is the optimisation of the process of obtaining brine purified using the lime-sodium method. After the purity of the target brine has been defined, the tool allows you to obtain the best operating parameters of the installation and suggests what media concentrations should be used to obtain the desired effect.

At the same time, the CIECH Group is working on many other research and development projects in the soda segment, focused on improving the efficiency of resource use, reducing waste and implementing the idea of a circular economy. An example of this is the active collaboration with the Department of Chemical Technology of the Nicolaus Copernicus University in Toruń, under which works are continued with regard to crystallisation in non-equilibrium conditions, waste stream management or modification of the Solvay soda production technique.

KINFRA to set up Rs 1,200 crore industrial park

The New Indian Express | 12 April 2022

Amid criticism that major businesses are not coming up in Ernakulam district, KINFRA (Kerala Industrial
Infrastructure Development Corporation) is planning to set up a Rs 1,200-crore petrochemical industrial park at Amabalamugal. The project is slated to come up on 481.79 acres purchased from FACT and is expected to be completed in 28 months.

Once completed, the park is expected to generate employment for nearly 11,000 people, with a possible investment from it is around Rs 10,000 crore, said an official. The authorities calculate there is potential for value addition through downstream industries that can utilise the feedstock from the petchem complex. Most of the raw materials — such as chlorine, formaldehyde — required for downstream industries are available in and around the area.

The work planned in the first phase include the main access road, internal roads, water distribution system, power distribution system, admin building, firefighting arrangements, compound wall and gate, and treated water supply from the KINFRA Export Promotion Industrial Park in Kakkanad. The estimated cost for the first phase is Rs 151.93 crore. “Mary Matha Infrastructures has been selected as the contractor. The deadline for the first phase is July 2024,” an official with the project said.

The work on the second phase will begin towards the end of the first phase. An effluent treatment plant and the development of pharma and healthcare zones will happen in the second phase. Industries Minister P Rajeeve will inaugurate the construction work on Wednesday.

Major boosts

• Raw materials from BPCL can be transported through a pipeline or internal road by trucks
• Transportation costs will be reduced for other units coming up in the park
• Pipeline connectivity from the refinery enables cost competitiveness
• Downstream investments in the micro, small, medium enterprises (MSME)
• Presence of GAIL pipelines
• Presence of Kerala Enviro Infrastructure for disposal of hazardous waste
• Scope for developing ancillary industries and supporting services

Boon for Kochi

“Already, nearly 20 investors have bought space in the park and more are expected,” said Santhosh Koshy Thomas, managing director of KINFRA. “Kochi is already running short of industrial areas. The MoU signed between the Kerala government and BPCL regarding the cost-effectiveness of feedstock and policies will attract more investors. The industrial water supply scheme of KINFRA, the construction of which has started, will be an added advantage,” he said.

Olin and Mitsui to set up JV for trading caustic soda and ethylene dichloride

Chemical Weekly | 12 April 2022
US-based chlor-alkali firm, Olin Corporation, and Japan’s trading giant, Mitsui & Co, have agreed to a memorandum of understanding to establish a joint venture (JV) that brings together Mitsui’s global logistics, supplier and customer relationships, and breadth of product portfolio with Olin’s scale, North American export capability, and production flexibility across the electrochemical unit (ECU) portfolio.

The JV will be an independent global buyer, supplier, and marketer of ECU-based derivatives, initially focused on globally traded (blue water) caustic soda and ethylene dichloride (EDC) with potential future expansion into other ECU derivatives and related products.

“By combining the complementary geographic and functional strengths of Olin and Mitsui, the joint venture will enable customers to benefit from greater security of supply, enhanced logistics reliability, increased access to global product liquidity, and network optimisation to support the decarbonisation agenda,” the companies said. The parties expect to commence the JV later this year.

Mr. Scott Sutton, Chairman, President & CEO of Olin commented, “Olin’s 130-year history in ECUs and Mitsui’s 70-year history in trading and logistics creates a natural partnership that will grow Olin’s parlay activities and grow Mitsui’s capacity to serve on a global scale. This innovative alliance will connect Olin’s leading asset positions with global product liquidity to reliably meet growing demand in increasingly sustainable ways.”

Mr. Takashi Furutani, Chief Operating Officer of Basic Materials Business Unit, Mitsui said, “It is an exciting challenge to establish a new joint venture which will operate independently from both parent companies and contribute to the sustainable development of the industry. The joint venture aims to bring value to the industry through optimising and streamlining the sourcing, supplying, and marketing of ECU-based derivatives. The joint venture also intends to help accelerate the industrial decarbonisation effort by enhancing its capabilities and network.”

Members’ News

Meghmani Finechem eyeing Rs. 5,000 crore revenue by FY27

Indian Chemical News | 26 April 2022
Meghmani Finechem Limited (MFL) is aiming to achieve Rs. 5,000 crore in revenue by FY27, translating to a revenue CAGR of 25%.
“I am happy to announce a 5-year vision of achieving Rs. 5,000 crore in revenue by FY27, translating to a revenue CAGR of 25% from here on. This growth will come from higher revenue contribution of value-added derivatives and specialty chemicals. We have announced to enter Chlorotoluene and its value chain and in a phased manner we will keep on announcing our further capex in the future. We continue to move forward in our strategic direction of expanding scale, strengthening integration and achieving low cost of operations,” said Maulik Patel, Chairman and Managing Director, Meghmani Finechem Limited.

The company has registered a revenue jump of 93% to reach Rs. 499 crore on account of higher realization for all the products.

The company has delivered a strong operating and financial performance in line with its commitment of growth. Overall plant utilisation increased to 87% in FY22 compared to 81% in FY21. Hydrogen Peroxide (H2O2) achieved capacity utilization of 78% in FY22, up 21% on a YoY basis; Caustic Soda & Caustic Potash ECU realisation is up by 74% and 27% respectively; CMS & H2O2 sales realisation is up by 53% and 20% respectively.

Expansion projects on track for completion as per schedule: ECH – 95%, CPVC Resin – 90% and Caustic Soda – 85%. In FY22, the company spent Rs. 449 crore on capital expenditure. MFL is expanding into Chlorotoluene and its value chain and establishing the R&D facility.

Commenting on the results, Patel said, “This has been a landmark year for MFL. I am pleased to announce; we have delivered record financial performance. We have achieved the highest ever Revenue and PAT of Rs. 1,551 crore and Rs. 253 crore. This is a testimony of our team’s effort of delivering excellence despite the tough external environment. Our strong operational efficiency and internal cost control measures allowed us to maintain margins even with the inflationary pressure.”

Andhra Chief Minister inaugurates Grasim’s chlor-alkali plant

Indian Chemical News | 23 April 2022

Andhra Pradesh Chief Minister YS Jagan Mohan Reddy and Aditya Birla Group Chairman Kumar Mangalam Birla, inaugurated Grasim Industries Limited’s chlor-alkali manufacturing site at Balabhadrapuram in East Godavari district on Thursday.

This chlor-alkali plant is the largest single-location manufacturing unit of caustic soda. Aditya Birla Group has invested Rs 1,000 crore on the plant initially. It plans to make a total investment of Rs 2,500 crore on the plant in three phases. The plant will provide direct and indirect employment to 2,450 people and of the total workforce, 75% will be locals.

Speaking on the occasion, Birla said the inauguration of the chlor-alkali plant heralds a new beginning. “It will further strengthen the bond of Aditya Birla Group with the entrepreneurial State of AP,” he said adding that this is an important milestone in the group’s chemical business.

The unit at Balabhadrapuram is the eighth manufacturing site of chlor-alkali of the group and has a potential to emerge as the single largest location of chlor-alkali production in the country with a capacity of 1,50,000 tonnes per annum, he said and added that given the scale of operation, he hopes to build a world-class chemicals ecosystem in the state what will have a multiplier effect on the local economy. It will also strengthen the east-west corridor for chlor-alkali business, he added.

“Grasim took over the ailing caustic soda manufacturing unit in 2019, which for nearly a decade had been facing problems. The previous TDP government gave its consent without resolving the problems and convincing people in the region, who had misapprehensions about the project. It was our government, which resolved the problems, convinced the management not to install captive thermal power plant, adopt zero liquid waste concept, go for electrolysis and other advanced technologies. By incorporating such measures, we succeeded in allaying fears of locals and most importantly we convinced Birlas to provide 75% of jobs to locals,” Reddy said.

CM Jagan invites Aditya Birla to be Ambassador of AP

Deccan Chronicle | 21 April 2022

Chief Minister Y.S. Jagan Mohan Reddy has requested Aditya Birla Group chairman Kumara Mangalam Birla to become the “Industrial Ambassador” of Andhra Pradesh so that the state attracts investments and industrialises rapidly.

Jagan Mohan Reddy made the appeal while inaugurating the first Chlori Alkali unit set up by Grasim Industries, a part of Aditya Birla Group, at Balabhadrapuram village in Bikkavole mandal of East Godavari on Thursday. The CM thanked ABG group for investing ₹ 2,470 crore in three phases, with ₹ 1,000 crore coming in first phase itself.

The Chief Minister appreciated that ABG group has agreed to state government’s stipulation that 75 per cent of jobs in the industry being set up be provided to locals.

Speaking on the occasion, Kumara Mangalam Birla pointed out that Grasim is the largest player in India when it comes to chemicals and stands among top 15 manufacturers globally. He pointed out that Aditya Birla Group is providing direct and indirect employment to about 10,000
people in Andhra Pradesh. It is also setting up a state-of-the-art garment manufacturing unit in Kadapa district to manufacture 1.8 million garments.

**Grasim Industries Ranked India’s Most Sustainable Company**

*Chemical Industry Digest | 20 April 2022*

Grasim Industries has been ranked number one in the debut 2021 Capri Global Capital Hurun India Impact 50, a list of top fifty companies headquartered in India based on their alignment with the seventeen Sustainable Development Goals (SDGs). With a cumulative sustainability score of forty-seven, Grasim Industries emerged as India’s most sustainable company. Tech Mahindra came second with a score of forty-six, followed by Tata Power Company and Wipro with forty-five each.

The highest measured pillar in the list is climate action with thirty-seven companies listing themselves in. This was followed by the responsible consumption and production pillar, measured by thirty-one companies. With eight goals, Hindustan Unilever has the highest number of measurable SDGs with time bound targets, followed by ITC, and Tech Mahindra with seven each. Interestingly, three companies in the list have no documented measurable goals against any pillars.

Only 29 companies have time bound targets to achieve carbon neutrality. ITC and Infosys achieved carbon neutrality in 2006 and 2020 respectively. Cipla and Adani Ports and Special Economic Zone target to achieve it by 2025. Mahindra and Mahindra, UltraTech Cement, Hindustan Zinc and Tech Mahindra have implemented an internal carbon pricing policy to reduce emissions.

Mumbai accounted for the maximum number of companies featured (27) followed by New Delhi with four.

Financial services led the industry segment represented with eight companies, followed by software and services with six. With an average score of 36, manufacturing companies scored higher than service companies which registered an average score of 34.

**GACL-NALCO JV commissions new chlor-alkali plant at Dahej**

*Chemical Weekly | 12 April 2022*

Gujarat Alkalies and Chemicals Ltd (GACL) has announced the partial commencement of caustic evaporation unit (CEU) by its joint venture (JV) company GACL-NALCO Alkalies & Chemicals (GNAL).

GNAL is a JV between GACL and National Aluminium Company (NALCO) formed to set up a 800-tpd caustic soda plant along with a 130-MW captive power plant at Dahej. GNAL is a material subsidiary of the company.

GNAL successfully completed the start-up of 200-tpd (ton per day) CEU along with boiler and required utilities in the cogeneration captive power plant and has produced 100-mt caustic soda lye (Rayon grade 47%). With the above, the CEU has been partially commissioned, the company said in a stock exchange filing.

The balance units of captive power plant and the caustic soda plant will be progressively commissioned in a phased manner, the company added.

**GHCL is coming up with a Greenfield project in Soda Ash; Rs 3,500 crore will be invested over the next three years: Ravi S Jalan, MD**

*Zee Business | 06 April 2022*

Ravi S Jalan, Managing Director, GHCL, talks about demand and pricing trends of soda ash, divestment of the textile business, soda ash and sodium bicarbonate production, consumer business, margins, demerger of soda ash and spinning businesses, business, acquisition plans and joint venture opportunities among others during a candid chat with Swati Khandelwal, Zee Business.

**Edited Excerpts:**

**Q:** Tell us about the demand for soda ash and pricing trend and how are the prices YoY and QoQ basis?

**A:** There is a firmness in the demand for soda ash due to two reasons and they are

(i) A huge growth is visible in solar glass globally including in India due to which the demand is good.

(ii) Demand is also good in flair glass and bottle glass, while there is slight slowness in detergent.

But overall demand for soda ash is quite good.

As far as pricing is concerned, the cost has increased a lot as the energy and other raw material prices have also surged a lot. But, we can pass on the cost increase to the customers. There has been a firmness in soda ash prices, which is also visible for the next two years.

**Q:** Input cost has risen across industries. What impact did it have on your company?

**A:** If seen from an overall perspective, there is a lot of volatility in energy due to which the number cannot be said with much certainty because the energy prices are still volatile. But, if I will talk about the energy prices, particularly coal then there is an increase of more than 100% in its prices. If I will talk about its overall impact on the products of the company then it will roughly have an impact of 20-25% on our cost. This is why the prices of soda ash are firm and we have been able to pass on this
cost to the customers. Therefore, our
margin is better than in the past at this
dpoint in time.

Q: Going ahead, what trends are
visible, do you have an appetite
to pass on the price hike to the
customers or you will have to absorb
it, which can impact your margins?

A: Amid the ongoing energy prices,
I do not see any possibility of much
increase in the prices of energy. If it
happens then - due to the situation
in which soda ash - we will be able to
pass on it to the customers.

Q: Company successfully divested
textile business to Indo Count for Rs
608 crore. How will you utilize the
proceeds and how FY23 would be
for the company in comparison to
the FY22?

A: Rightly said that we have divested
our home textile business to Indo
Count. It was a strategic call because
we were in this business for the last
13-14 years and our performance was
not up to mark in this segment. It was
not coming in our core competency.
Instead of that spinning and soda ash
business is our core competency. So,
we have strategically divested this
business. You are well aware that our
cash generation per year stands at
around Rs 600-700 crore. So, all these
resources will be used in the growth
journey of soda ash and spinning
businesses. We are coming up with a
Greenfield project in Soda Ash which
will require an investment of around Rs 3,000-3,500 crore. The project will
take almost three to three and half
years in being created and all these
resources and cash generations will
be used on that front. Even after this
investment, our debt-equity ratio will
lie between 0.2 and 0.3. I just want
to highlight that despite this huge
investment our debt-equity ratio will
remain quite healthy and we will not
be leveraged.

Q: The company’s CapEx for the
production of soda ash is likely to
increase by 1 lakh tons per annum
and sodium bicarbonate by 60,000
metric tons. By when will this
happen and are will this CapEx of
Rs 3,000 crore will be used for the
same purpose?

A: The investment in Sodium
Bicarbonate will be completed by
September 2022 after which its
production will double from 60,000
metric tons. In the case of soda ash
expansion, we have completed an
expansion of 1 lakh tons and now,
we are establishing a Greenfield
project after which the production
will increase by another 5 lakh tons. It
will be based at a new location, which
will require an investment of Rs 3,500
crore.

Q: By when it will be completed?

A: It is likely to be completed by
March 2025, which means it will be
completed in the next three years. It is
a massive investment and includes big
land acquisitions.

Q: Tell us more about your
consumer business, what sort of
growth trends do you foresee in
coming years and what are your
expectation from this business this
year and the next two years?

A: We do not have any major
investment in this business. It is a
B2C business and does not require
a huge investment. Our second
focus area is the spinning business,
where we have made investments
to grow its volume by almost 20%
and the process will be completed in
July 2022. After its completion, our
volume in the spinning business will
increase by 20%. Plus, we are also
taking a big step on green energy
and are investing in 30 megawatts of
solar energy of which 20 megawatts
became operational in March 2022
and the other 10 megawatts will be
completed by June 2022. Post this,
80% of the power requirement in
the spinning business will be fulfilled
by green energy. Moving forward, in
our spinning business - where we are
doing good, where the average of the
five years EBITDA return stands at 18% -
we will continue to grow it by 20%,
i.e., 40,000 spinners every two years.
So, in the next five years, we will
invest around Rs 1,300-1,400 crore in
the segment. The investment will be
made mainly in spinning and green
energy. We will always have a target
to match the green energy portfolio,
so that 80-85% of our power is met by
green energy, like solar or wind.

Q: You will invest Rs 1,300-1,400
crore in the spinning businesses as
well. Is this slated for this year?

A: This investment of Rs 1,400 crore
will happen in the next five years. In
every second year, there will be an
investment of around Rs 300-350
crore and the profit generated from
the same business will be ploughed
back into the same. Our debt-equity
situation will not go up. It will happen
through internal accruals. Hopefully,
you are aware that our spinning
business will demerge in September
2022 after which two different
companies will be created. One will
be a Soda Ash company and will
be GHCL Limited and the second is
GHCL Textile, which will house the
spinning business. The turnover of the
spinning business is around Rs 1,000
crore this year and which will go up to
Rs 2,000 crore in the next five years.
This is going to be our growth strategy.

Q: You are seeing a good EBITDA
margin of 18% from the spinning
business. Which kind of trends is
visible in it and do you think that the
margins will improve further in the
coming future due to an increase in
the capacity?

A: As I have said that our margin stood
at around 18% in the last five years,
however, it was higher last year and it
stood around 26%. Going forward, I
believe that it is a 20% EBITDA margin
business. The way we are investing
in green energy and expanding our
product basket and are going towards
value-added products in spinning,
so, a long term sustainable margin of
Q: This means you will get the approvals by Q2FY23 and these companies will also be demerged in the same quarter?
A: Yes, this will happen. In fact, this company will become two separate companies by Q3FY23.

Q: Have you made any decision on the ratio part among others?
A: It has happened. Basically, we are splitting it vertically and the shareholders will get shares in both of the companies. Thus, chemical shares will stay with them and they will get the same number of shares at a face value of Rs 2 per share in the textile business. Thus, they will have one share of both companies if they have one share.

Q: Tell us about your acquisition plans and do you have any good opportunities in the market
A: We have a clear focus on staying in the chemical and spinning space. We are not looking at anything beyond this because we want to focus only on our core competencies. We have two to three top priorities at present like the Greenfield project. After completion, it will provide a long term growth advantage to us as we will be able to invest in additional chemicals at the location where the soda ash plant is being built. So, this journey of soda ash along with some other products in the basket, we will be able to do there. As far as the acquisition is concerned, we do not have any such opportunity at present but whatsoever will be done will happen in the chemical space and that in chemicals related to us.

Q: Are you exploring any joint venture opportunities in automation?
A: We have a big focus on automation and are focusing on machine learning, and intelligence to increase productivity. We are also focusing to atomize of all of our processes and the works that are going on in which several machines and equipment are being automized, which will enhance our productivity and this is our journey. As far as the joint venture is concerned, we continue to explore this opportunity and if we get any opportunity in the area related to us then we will focus on it.
Kori is dedicated to the research, design & manufacture of high power rectifier equipment. We supply high reliable and high cost effective industrial rectifiers system for global users.

We have customers in Belgium, France, Sweden, Switzerland, Germany, Iceland, Russia, Australia, Qatar, India, Thailand, Bangladesh, Laos, Vietnam, Iran, Indonesia, Zambia, Canada, Cuba, etc. There are more than 1000 sets of rectifier system from us running all over the world up to now.

Belgium Inovyn Bigan Project
## KEY INDICATORS MARCH 2022

### 1 Alkali Imports (MT)

<table>
<thead>
<tr>
<th></th>
<th>Qty (Mar 2022)</th>
<th>Qty (Mar 2021)</th>
<th>&quot;% Difference (Y-o-Y)&quot;</th>
<th>Qty (Feb 2022)</th>
<th>&quot;% Difference (M-o-M)&quot;</th>
<th>&quot;FY 2021-22 (upto Mar)&quot;</th>
<th>&quot;FY 2020-21 (upto Mar)&quot;</th>
<th>% Difference Total Imports 2020-21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caustic Soda</td>
<td>22,816</td>
<td>18,550</td>
<td>23.0%</td>
<td>11,829</td>
<td>92.9%</td>
<td>200,151</td>
<td>314,110</td>
<td>-36.3%</td>
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<tr>
<td>Soda Ash</td>
<td>35,043</td>
<td>39,237</td>
<td>-10.7%</td>
<td>54,310</td>
<td>-35.5%</td>
<td>568,929</td>
<td>705,966</td>
<td>-19.4%</td>
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<tr>
<td>Sodium Bicarbonate</td>
<td>1,788</td>
<td>2,178</td>
<td>-17.9%</td>
<td>561</td>
<td>218.9%</td>
<td>16,403</td>
<td>24,451</td>
<td>-32.9%</td>
</tr>
</tbody>
</table>

Average Price in Mar 2022: Caustic Soda - 604 USD/MT (Lye), 726 USD/MT (Flakes) & 799 USD/MT (Solids); Soda Ash - 288 USD/MT; Sodium Bicarbonate - 448 USD/MT

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

<table>
<thead>
<tr>
<th></th>
<th>Mar 2022</th>
<th>Mar 2021</th>
<th>% Difference</th>
<th>&quot;FY 2021-22 (upto Mar)&quot;</th>
<th>% Difference</th>
<th>Total Imports 2020-21</th>
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<tbody>
<tr>
<td>Imports</td>
<td>59.1</td>
<td>48.9</td>
<td>20.8%</td>
<td>610.2</td>
<td>54.7%</td>
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<tr>
<td>Exports</td>
<td>40.4</td>
<td>35.3</td>
<td>14.5%</td>
<td>417.8</td>
<td>43.2%</td>
<td>291.8</td>
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<tr>
<td>Surplus/Deficit</td>
<td>-18.7</td>
<td>-13.6</td>
<td></td>
<td>-192.4</td>
<td>-102.6</td>
<td>-102.6</td>
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</table>

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

<table>
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<tr>
<th></th>
<th>Mar 2022</th>
<th>Feb 2022</th>
<th>Jan 2022</th>
</tr>
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<tbody>
<tr>
<td>76.24</td>
<td>75.00</td>
<td>74.44</td>
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### 4 Index of Industrial Production (Base: 2011-12=100)

<table>
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<tr>
<th></th>
<th>Mar 2022</th>
<th>Mar 2021</th>
<th>% Difference</th>
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<tbody>
<tr>
<td>148.3</td>
<td>145.6</td>
<td>1.9%</td>
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### 5 Index of Core Industries (Base: 2011-12=100)

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<th></th>
<th>Mar 2022</th>
<th>Mar 2021</th>
<th>% Difference#</th>
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<tr>
<td>157.3</td>
<td>150.8</td>
<td>4.3%</td>
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</table>

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

<table>
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<th></th>
<th>Mar 2022</th>
<th>Mar 2021</th>
<th>% Difference#</th>
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<td>144.6</td>
<td>139.0</td>
<td>4.0%</td>
<td></td>
</tr>
<tr>
<td>144.6</td>
<td>143.3</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>191.0</td>
<td>180.0</td>
<td>6.1%</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Mar 2022</th>
<th>Mar 2021</th>
<th>% Difference#</th>
</tr>
</thead>
<tbody>
<tr>
<td>121.0</td>
<td>127.9</td>
<td>-5.4%</td>
<td></td>
</tr>
<tr>
<td>118.7</td>
<td>119.6</td>
<td>-0.8%</td>
<td></td>
</tr>
<tr>
<td>83.9</td>
<td>89.7</td>
<td>-6.5%</td>
<td></td>
</tr>
<tr>
<td>198.2</td>
<td>184.7</td>
<td>7.3%</td>
<td></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.

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

<table>
<thead>
<tr>
<th></th>
<th>Mar 2022</th>
<th>Mar 2021</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>118.8</td>
<td>116.7</td>
<td>1.8%</td>
</tr>
<tr>
<td>Russia</td>
<td>NA</td>
<td>113.9</td>
<td>-</td>
</tr>
<tr>
<td>Brazil</td>
<td>NA</td>
<td>96.3</td>
<td>-</td>
</tr>
<tr>
<td>European Union (27)</td>
<td>107.1</td>
<td>106.5</td>
<td>0.6%</td>
</tr>
<tr>
<td>USA</td>
<td>103.6</td>
<td>98.3</td>
<td>5.4%</td>
</tr>
<tr>
<td></td>
<td>102.7</td>
<td>95.6</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Mar 2022</th>
<th>Mar 2021</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>167.7</td>
<td>156.8</td>
<td>7.0%</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Mar 2022</th>
<th>Mar 2021</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>126.0</td>
<td>119.6</td>
<td>5.4%</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Mar 2022</th>
<th>Feb 2022</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Foreign Direct Investment</td>
<td>2,742</td>
<td>4,224</td>
<td>-35.1%</td>
</tr>
<tr>
<td>Net Portfolio Investment</td>
<td>-5,251</td>
<td>-5,492</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>-2,509</td>
<td>-1,268</td>
<td>-</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Mar 2022</th>
<th>Feb 2022</th>
<th>Jan 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>18</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Mar 2022</th>
<th>Feb 2022</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>618</td>
<td>632</td>
<td>-2.2%</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>% of Actuals to Budget Estimates FY 2021-22</th>
<th>% of Actuals to Budget Estimates FY 2020-21</th>
</tr>
</thead>
<tbody>
<tr>
<td>99.7%</td>
<td>98.4%</td>
<td></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>Mar 2022</th>
<th>Feb 2022</th>
<th>Jan 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.0</td>
<td>54.9</td>
<td>54.0</td>
<td></td>
</tr>
</tbody>
</table>

Index over 50 shows expansion, while below 50 means contraction.
Data Source: GOI, OECD, IHS & AMAI Research
INTRODUCTION:
The Unisafe emergency kit contains devices to stop leaks at the valves, fusible plug and on the side wall of tonners. Leaks in tonners rarely occur. However, when they do, an immediate corrective action is required by trained personnel with special equipment else results in serious harm. Thus response time is very critical in managing the emergency. Unisafe pre-assembled emergency kit can manage the leak time to minimum.

SPECIAL FEATURES:
- Pre-assembled unit largely reduces assembly time
- Compact & ergonomical design
- Lightweight (<11Kgs) for ease of handling
- Only 1 or 2 persons can handle reducing potential exposure
- Adjustable centering design to attend valve & plug leakage
- Common wrench to operate the kit
- Manufactured with industrial grade HE30 Aluminium Alloy
- Anodised Coating improves surface durability
- This kit is also Corrosion Resistance
- Single solution for arresting leak from valve & plug-multitasking device
- Nylon adjustable Straps with yoke to arrest leaks from body

Scan & Check out our product video on YOUTUBE:
Business Unit Uhde

600 and counting!

It’s a matter of pride for us to recount our group’s association with the Chlor-Alkali Industry across the globe.

An association dating back to 5 decades, over 600 plants, a staggering 40 million tonnes of Caustic Soda annually, and a Customer list that covers the Who’s Who of the Chlor-Alkali Industry.

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Mumbai - 400083, Maharashtra, India.
Tel. No.: +91 22 4047 8000
Email: tki@thyssenkrupp.com
Website: www.thyssenkrupp-industrial-solutions.com/india/
Pulse Jet Candle Filter

Salient Features

- No moving parts, no bearings
- 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

Reference List

- Orient Paper Mills, M.P.
- Grasim Industries, Ganjam
- Gharda Chemicals, Lote
- Koruma Tarim, Turkey
- TGV SRAAC Ltd., Kurnool (Formerly, Rayalseema Alkalies)
- Punjab Alkalies & Chemicals Ltd., Chandigarh

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