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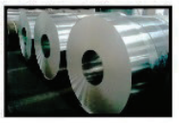

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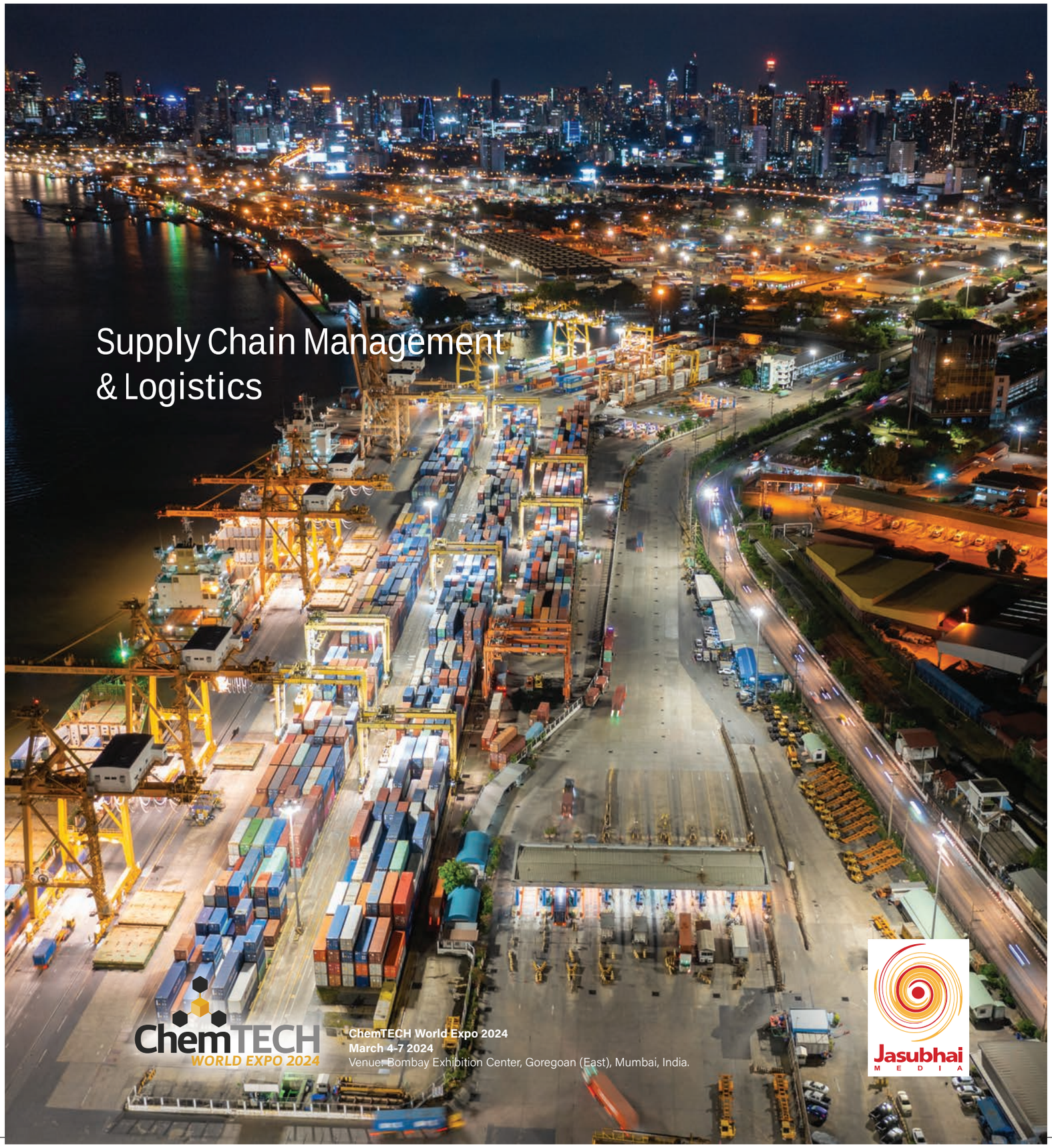

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Gujarat Inks MoUs Worth ₹ 67,000 Crore at Vibrant Gujarat Global Summit

Gujrat, India: In anticipation of the upcoming Vibrant Gujarat Global Summit, 11 significant Memoranda of Understandings (MoUs) were inked, signaling a massive investment potential exceeding ₹ 67,000 crore in the petrochemical sector. The agreements were sealed during the 'FutureChem Gujarat' event held in Bharuch this December, attracting policymakers, industry leaders, and academics for discussions on future initiatives in the chemicals and petrochemicals industry.

Gujarat Chief Minister Bhupendra Patel highlighted the state's trajectory toward becoming a hub for the petrochemical industry, noting the substantial trade and activity in the sector. In his address, he emphasized the state's commitment to sustainable industry growth, especially in the chemical and petrochemical domain, announcing the theme of the 2024 Vibrant Summit as 'Gateway to the Future.'

The Vibrant Gujarat Global Summit, initiated in 2003 by former Chief Minister Narendra Modi, has played a pivotal role in positioning Gujarat on the global map of trade and industry. The recent MoU signings underscore the state's strategic focus on fostering robust growth and investment in the vital petrochemical sector, aligning with its vision for a dynamic and sustainable industrial landscape.

PM Modi unveils ₹ 20,000 Crore worth Development Projects in Tamil Nadu

Tamil Nadu, India: Prime Minister Narendra Modi inaugurated and laid the foundation stone for development projects exceeding ₹20,000 crores in Tiruchirappalli, Tamil Nadu. The diverse projects encompass rail, road, oil and gas, and shipping sectors, fostering progress in the state. Addressing the gathering, the Prime Minister extended New Year wishes and expressed joy at commencing 2024 with a significant

Esha Srivastava (IFS) appointed as JS in Petroleum Ministry

The Appointments Committee of the Cabinet (ACC) has approved the appointment of Esha Srivastava (IFS) as Joint Secretary in the Ministry of Petroleum & Natural Gas (MoPNG). According to an order issued from the Department of Personnel & Training (DoPT), she has been appointed to the post for an overall tenure of five years.

Srivastava is an Indian Foreign Service (IFS) officer. She completed her post-graduation in Political Science (Honors) from Lady Shri Ram College of Delhi University. She is the recipient of the prestigious Dr. Karan Singh Gold Medal for topping Delhi University at post-graduation level.

She had served in the Permanent Delegation of India to UNESCO in Paris and in the Indian High Commission or Embassy in Sri Lanka and Bhutan. She has also served in the Ministry of External Affairs as Under Secretary, Deputy Secretary, Europe West Division, and Director. Her last assignment was as the Deputy Chief of Mission in Thimphu.

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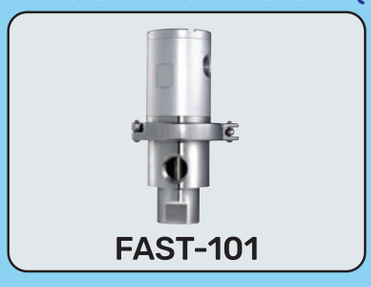
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program in Tamil Nadu. He lauded the projects' collective value, emphasizing their role in enhancing Tamil Nadu's growth across roadways, railways, ports, airports, energy, and petroleum pipelines. Many of these initiatives are poised to enhance travel and generate numerous job opportunities.

During the event, PM Modi inaugurated the new terminal building at Tiruchirappalli International Airport, a two-level facility costing over ₹ 1100 crores, designed to accommodate over 44 lakh passengers annually. The Prime Minister dedicated various railway projects, including the doubling of key rail sections and electrification projects, aiming to improve rail capacity and contribute to economic development. Additionally, he inaugurated five road sector projects, facilitating safer and quicker travel while enhancing connectivity to industrial and commercial hubs in the region. PM Modi also laid the foundation stone for crucial road development projects, emphasizing their significance in bolstering connectivity and economic growth. The inauguration of the General Cargo Berth-II at Kamarajar Port further signifies a step toward strengthening the country's trade, fostering economic growth and job creation.

Honorable Prime Minister inaugurates SECI's Pioneering Solar Power Plant in Lakshadweep

New Delhi India: In a significant stride towards sustainable energy solutions, Prime Minister Narendra Modi inaugurated the Solar Energy Corporation of India's (SECI) groundbreaking solar power plant at Kavaratti in January. This marks the region's inaugural on-grid solar project equipped with state-of-the-art Battery Energy Storage System (BESS) technology. The two SECI installations boast a collective solar capacity of 1.7 MW, complemented by a cutting-edge 1.4 MWh battery storage facility.

Rashmi Govil set to be next Director (HR) of Indian Oil

Rashmi Govil is set to be next Director (HR) of Indian Oil Corporation Limited (IOCL), a Maharatna PSU under the Ministry of Petroleum & Natural Gas (MoPNG). She has been recommended for the post by the Public Enterprises Selection Board (PESB) panel. Prior she had been serving as Executive Director (HRD & ER) in the same organisation.

Govil has been recommended for the post of Director (HR) of Indian Oil from a list of 11 candidates who were interviewed by the PESB selection panel in its selection meeting held in December. Out of 11 candidates, five candidates were from Indian Oil and one each from HPCL, MRPL, Coal India Limited, CONCOR, Oil India Limited and the Department of Tele communications.

Govil is an HR veteran, having professional experience of over three decades in entire gamut of HR with expertise in HR strategy, L&D, talent management, employee relations, and digital adoption and HR operations. She holds an MBA in Human Resource Management from Bundelkhand University, Jhansi.

She has a very long association with Indian Oil, she joined Indian Oil in October 1994 and rose to her current position.

She will be overall in-charge of coordinating and implementing personnel and industrial relations policies, management functions, administrative control etc. in the organisation.

This milestone initiative is poised to significantly diminish reliance on diesel-based power generation in Kavaratti. The Lakshadweep Energy Development Agency (LEDA) will now tap into the solar plants, effecting a pivotal transition from conventional power sources to sustainable and eco-friendly energy.

Foreseen to accrue commercial savings amounting to ₹250 crores over its anticipated technical lifespan, the project is poised to reduce diesel consumption by an impressive 190 lakh litres while offsetting 58,000 tonnes of carbon dioxide emissions. Spearheaded by SunSource Energy for Engineering, Procurement & Construction (EPC), this SECI undertaking underscores a substantial commitment to green energy, signaling a cleaner and more sustainable future for Lakshadweep. As a Miniratna Category-I Central Public Sector Unit under the Ministry of New and Renewable Energy, SECI plays a pivotal role in advancing various renewable energy resources and storage systems, aligning with India's broader green energy objectives.

NITI Aayog Launches G20 Report for Green and Sustainable Global Growth

New Delhi, India: In a significant development, Hon'ble Union Minister Bhupender Yadav inaugurated the release of a crucial NITI Aayog report titled 'A Green and Sustainable Growth Agenda for the Global Economy' in New Delhi. Launched in collaboration with the International Development Research Centre (IDRC) and the Global Development Network (GDN), the report

is based on the insights from the G20 international conference held recently.

The event, attended by key dignitaries including Shri Amitabh Kant, India's G20 Sherpa, highlighted the report's relevance, especially as Brazil assumes the G20 presidency from India. Minister Yadav emphasized India's commitment to collaborative climate action and the need for developed nations to support the Global South in combating climate change.

Amitabh Kant acknowledged NITI Aayog's efforts in organizing the international conference, stating that inputs from the event played a role in shaping the New Delhi Leaders' Declaration. Suman Bery, Vice Chairman of NITI Aayog, emphasized the significance of the report as a means to transfer knowledge to Brazil. The discussions centered on the imperative of a just transition for climate change mitigation and its positive economic impacts for developed and emerging economies. The event showcased a collective commitment to shaping a more sustainable and equitable global future.

RK Tyagi assumes charge as new CMD of Power Grid

Ravindra Kumar Tyagi has assumed charge as Chairman & Managing Director (CMD) of Power Grid Corporation of India (PGCIL) . Prior to this, he was serving as Director (Operations) of the company. With his, Tyagi has succeeded K Sreekant, who was heading the organisation since August 2019.

Tyagi has over 33 years of rich experience in the power sector at various key positions in leading CPSUs. He has handled multi-disciplinary work in various business areas of Power Grid such as asset management, engineering, business development (domestic and overseas), telecom, load dispatch & communication, NTAMC, DMS etc. and head of Power Grid's North Eastern Region.

Tyagi is an Electrical Engineer from Punjab Engineering College (PEC), Chandigarh and M Tech in Energy Studies from IIT Delhi. He is a "Fulbright Scholar" from Carnegie Mellon University, USA. He is an author of more than 50 technical papers presented in National and International conferences. He has represented India in many International technical committees for preparing various Technical Standards. Tyagi is a recipient of various national and international recognitions.

Jan Aushadhi Kendra initiatives unveiled through PACS

New Delhi, India: In a significant move, the Ministry of Cooperation has widened the scope of Primary Agricultural Credit Societies (PACS) to include the opening of Jan Aushadhi Kendras, as highlighted in the National Mega Conclave on "PACS as Pradhan Mantri Bharatiya Jan Aushadhi Kendra." Union Ministers Amit Shah and Mansukh Mandaviya addressed the conclave, emphasizing the transformative impact of the Jan Aushadhi initiative.

Amit Shah stressed that allowing PACS to open Jan Aushadhi Kendras would not only benefit cooperative societies but also reach the lowest strata of the community. He noted that over the last nine years, approximately ₹ 26,000 crores have been saved through Jan Aushadhi Kendras, providing generic medicines at 50-90% lower prices than the market.

Dr. Mansukh Mandaviya announced plans to open 2,000 Jan Aushadhi Kendras through PACS in the first phase. He highlighted that the Jan Aushadhi scheme aims to provide good and affordable medicines, creating employment opportunities. Currently, more than 10,500 Jan Aushadhi Kendras operate in the country, offering over 1,965 high-quality medicines and 293 surgical products at 50-90% lower costs than branded alternatives.

The conclave showcased the government's commitment to making quality and affordable healthcare accessible to all, especially the economically disadvantaged.

Indian Government Urges Exclusive Use of C-Heavy Molasses for Ethanol Production

New Delhi, India: The Indian Government is urging sugar mills to prioritize C-heavy molasses (CHM) for ethanol production, aiming to boost sugar output. This directive extends to sugar mills with dual feedstock units, emphasizing the use of a single feedstock at a time. In the revised guidelines for the 2023-24 sugar season, mills with dual feedstock units must operate on one feedstock for a minimum of 20 days before any transition, with a mandatory one-week notice for feedstock changeovers.

The guidelines, a response to the ban on rectified spirit (RS)/extra neutral alcohol (ENA) production from sugarcane juice and B-heavy molasses (BHM), enforce strict separation measures for processing lines with different feedstocks. Ethanol produced must be certified by the state excise department or a designated authority, indicating the grain type used, and meet quality standards per IS 15464 (2022).

This comprehensive approach aligns with the government's goal of optimizing ethanol production from diverse feedstocks, including CHM, BHM, sugarcane derivatives, surplus rice, and damaged food grains, fostering transparency and quality assurance in the process.

India's Chemical Industry attracts Robust ₹ 14,662 Crore FDI in FY 2022-23

New Delhi, India: The fiscal year 2022-23 witnessed a robust foreign direct investment (FDI) inflow of ₹ 14,662 crore into India's chemical industry. The Department of Chemicals and Petrochemicals played a pivotal role in steering sectoral growth, emphasizing reduced import dependence, enhanced infrastructure, and a favorable business environment.

Key initiatives included the effective implementation of the New Scheme of Petrochemicals, promoting research and innovation through schemes like Centers of Excellence and Plastic Parks. Quality Control Orders (QCOs) were initiated to make Bureau of Indian Standards (BIS) standards mandatory for certain chemicals, ensuring adherence to specified parameters.

International conferences and summits, such as the B20 International Conference and the 'Global Chemicals and

Petrochemicals Manufacturing Hub in India' summit, provided platforms for industry leaders to discuss sustainable transitions and global manufacturing.

Additional qualifiers (IUPAC and CAS No.) were mandated in import/export declarations for chemicals, effective from October 1, 2023. The chemicals sector attracted 100% FDI under the automatic route, registering the highest growth of 91% over FY 2021-22. These initiatives underscore the government's commitment to fostering growth, innovation, and sustainability in the chemical and petrochemical sector, positioning India as an attractive destination for foreign investments.

Cabinet Nod for India-Guyana MoU in Hydrocarbon Sector

New Delhi, India: The Union Cabinet, under the leadership of Prime Minister Narendra Modi, has approved the signing of a Memorandum of Understanding (MoU) between India's Ministry of Petroleum & Natural Gas and Guyana's Ministry of Natural Resources, focusing on collaboration in the hydrocarbon sector. The comprehensive MoU encompasses various aspects, including the sourcing of crude oil from Guyana, Indian companies' involvement in exploration and production (E&P) in Guyana, cooperation in crude oil refining, capacity building, bilateral trade enhancement, collaboration in the natural gas sector, and joint efforts to develop regulatory policy frameworks in Guyana's oil & gas sector. Additionally, the agreement covers cooperation in clean energy, including biofuels and renewables like solar energy.

The MoU aims to strengthen bilateral trade, encourage investments, and diversify crude oil sources, contributing to India's energy security. By facilitating Indian companies' participation in Guyana's E&P sector, the collaboration aligns with India's vision of "Aatmanirbhar Bharat" (self-reliant India). The agreement is set to remain in force for five years, automatically renewing on a quinquennial basis unless either party provides a three-month notice of termination. Given Guyana's emergence as a significant global oil producer, the MoU aligns with India's strategy to secure diversified and quality overseas assets in the hydrocarbon sector.

RK Singh Urges Grid India readiness for Disruptive Growth in Power Sector

New Delhi, India: Addressing employees on the 7th Grid-India Day, Power Minister RK Singh emphasized the inevitability of disruptive growth in the power sector's future. As the backbone of the power sector, Singh urged Grid India employees to prepare for forthcoming challenges aligning with a growing economy's shift towards increased renewable energy. Singh noted the historic linear growth and emphasized the impending transformative phase, stressing the need for Grid India to adapt to the evolving landscape.

Singh highlighted the challenges accompanying the greater integration of renewable energy (RE), anticipating the introduction of new systems, an increased share of renewable energy, and distributed renewable energy. He acknowledged the successful integration of renewables so far but emphasized that the future would witness a larger share of renewable capacity, necessitating enhanced integration efforts. To address intermittence, Singh mentioned plans to incorporate storage in future capacity additions to renewables. He also underscored the rising trend of distributed generation, with initiatives like rooftop solar, transforming consumers into prosumers.

Encouraging Grid India to envision solutions, Singh urged employees to consider challenges arising from ambitious national goals, such as widespread rooftop solar deployment, fully electric cooking, and the integration of millions of electric vehicles into the grid. The 7th Grid-India Day commemorated seven years of the independent functioning of Grid Controller of India Limited as a Central Public Sector Enterprise.

Reliance Industries implements Chemical Recycling for Circular Polymers

Mumbai, India: Reliance Industries Limited (RIL), the operator of the world's largest integrated refining and petrochemical complex, has marked a significant milestone by becoming the first Indian company to employ chemical recycling for plastic waste-based pyrolysis oil, transforming it into International Sustainability & Carbon Certification (ISCC)-Plus certified Circular Polymers. This groundbreaking innovation underscores RIL's dedication to reducing plastic waste and promoting a Circular Economy in India.

In its inaugural shipment, RIL dispatched the first batch of ISCC-Plus certified Circular Polymers, named CircuRepol (Polypropylene) and CircuRelene (Polyethylene). This pioneering use of new technology in India demonstrates RIL's commitment to making a positive environmental impact by converting plastic waste into specialized Circular Polymers.

RIL's Jamnagar refinery, securing the ISCC-Plus certification, has become the first refinery capable of producing Circular Polymers through chemical recycling. The certification ensures adherence to traceability and regulations in Circular Polymer production.

CircuRepol and CircuRelene set the standard for Circular Economy practices, showcasing RIL's dedication to sustainability and its pursuit of innovative solutions to reduce plastic waste. RIL's technology converts various plastic waste types, including single-use and multi-layered plastics, into pyrolysis oil, a key component in producing high-quality Circular Polymers.

Utilizing continuous catalytic pyrolysis technology, RIL's chemical recycling process achieves high yields of superior quality pyrolysis oil from plastic waste, offering a promising solution to the challenges posed by traditional pyrolysis methods.

L&T wins over US$ 600.34 million power and water systems order in Saudi Arabia

Saudi Arabia & India: Larsen & Toubro (L&T) announced a significant order win from Saudi Arabia, valued at over US$ 600.34 million for power generation and water systems. According to the official statement, L&T has been selected as the turnkey Engineering, Procurement, and Construction (EPC) contractor for the AMAALA project in the Red Sea region of Saudi Arabia. This project involves establishing various systems related to renewable energy generation and utilities. AMAALA, situated in the Prince Mohammed bin Salman Natural Reserve along Saudi Arabia's northwestern coast, is an ultra-luxury destination. While L&T has not disclosed the exact value of the order win, the statement suggests a valuation falling within the range of US$ 600.34 million to US$ 1.20 billion.

L&T reported that a consortium comprising the clean energy leaders of the United Arab Emirates, Masdar, and the French electricity utility EDF has executed the concession agreement for this fully integrated utility project with AMAALA's developers. L&T has formally entered into an EPC agreement with the project sponsors, EDF and Masdar. This development underscores L&T's continued involvement in large-scale infrastructure projects, particularly in the renewable energy and utility sectors.

RECPDCL signs MoU with Government of Gujarat for Smart Metering Project

New Delhi, India: REC Power Development and Consultancy Limited (RECPDCL), a wholly-owned subsidiary of REC Limited, a Maharatna PSU under the Ministry of Power and a leading NBFC, has entered into a Memorandum of Understanding (MoU) with the Government of Gujarat for ₹ 2,094.28 crore. This agreement pertains to the execution of the smart metering project in Paschim Gujarat Vij Company Limited (PGVCL) under Phase 1 of the RDSS Scheme. The MoU, signed prior to the Vibrant Gujarat Summit 2024, involved GUVNL's Managing Director (MD) Jai Prakash Shivahare (IAS) and RECPDCL's CEO Rajesh Kumar Gupta, with the honorable Chief Minister of Gujarat, Bhupendra Patel, in attendance.

In this strategic partnership, the Government of Gujarat commits to facilitating RECPDCL in acquiring necessary permissions and clearances for their forthcoming projects within the state. The collaboration aligns seamlessly with the prevailing policies, rules, and regulations of the state government, exemplifying a steadfast dedication to fostering development and innovation.

The MoU delineates a time-bound framework aimed at expediting the establishment of RECPDCL's projects in Gujarat. This collaboration underscores the state's unwavering commitment to creating an enabling environment for businesses and initiatives, contributing significantly to economic growth and sustainable development.

DP World to infuse ₹ 24,000 Crore into Gujarat's Logistics Landscape

Gujrat, India: Dubai-based global logistics giant, DP World, is set to make a substantial investment of ₹ 24,000 crores in Gujarat, India. The commitment encompasses diverse logistic facilities across the state, with a pivotal proposal to construct a port at Nargol in South Gujarat.

In a significant move, DP World recently formalized six Memoranda of Understanding (MoUs) with the Gujarat Maritime Board (GMB), a state government agency. These strategic agreements mark a prelude to the Vibrant Gujarat Summit's 10th edition, scheduled for later this year.

A noteworthy component of this investment involves ₹ 10,000 crores earmarked for transforming Nargol into a 'Mega Multi-commodity Deep Draft Port.' Positioned by the state government as a prospective alternative to Mumbai's Jawaharlal Nehru Port (JNPT), this development is aligned with Gujarat's vision for port-led infrastructure growth.

Beyond Nargol, DP World has committed ₹ 5,000 crores for a multi-purpose deep draft port in Kutch and an additional ₹ 2,000 crores for a similar facility in Jamnagar district. This ambitious investment plan also includes expansions of DP World's existing facilities in the state, with operational hubs in Mundra, Kutch (since 2003), and inland terminals at Ahmedabad and Hazira near Surat.

The foresightedness of DP World's investments is poised to play a pivotal role in bolstering Gujarat's position as a key player in India's rapidly evolving logistics landscape.

Suzlon Energy secures major Wind Power deal

Maharashtra, India: Renewable energy leader Suzlon Energy has clinched a significant order for 100.8 MW from Mahindra Susten. The project, set in Maharashtra, will see the installation of 48 units of USS 120-140 meters wind turbine generators (WTGs) featuring a hybrid lattice tubular (HLT) tower, each boasting a rated capacity of 2.1 MW. Suzlon's responsibilities encompass the entire project lifecycle, including supply, installation, and commissioning.

In addition to the project's initiation, Suzlon will also provide post-commissioning operation and maintenance (O&M) services. The generated electricity is earmarked for supply to commercial and industrial (C&I) customers in Maharashtra, contributing to the region's sustainable energy goals.

This accomplishment follows Suzlon's recent success in securing a parallel 100.8 MW order from a prominent Nordic Energy Company. The earlier project involved the installation of 32 WTGs with an HLT tower and a rated capacity of 3.15 MW each.

As Suzlon continues to make strides in the renewable energy sector, these endeavors underscore its commitment to spearheading independent power producer (IPP) projects, driving the widespread adoption of renewable energy in India.

Adani partners with Esyasoft holdings for Smart Metering Ventures

Gujrat, India: Adani Transmission Step-Four (ATSFL), a subsidiary of Adani Energy Solutions (AESL), is set to collaborate with Esyasoft Holdings (EHL) from the UAE to embark on smart metering projects in India and globally.

The agreement outlines the licensing of intellectual property rights for software products and solutions related to smart meters and industrial applications. The joint venture (JV) between ATSFL and EHL will facilitate the development of these products and solutions.

In the proposed JV structure, ATSFL and EHL will hold 49 percent and 51 percent shareholding, respectively, ensuring equal participation in the Board of Directors (BoDs) of the new company.

Simultaneously, AESL has received a letter of intent (LoI) for the acquisition of Halvad Transmission from PFC Consulting. This strategic move aims to support the evacuation of seven gigawatts of renewable energy (RE) from the Khavda RE Park in Gujarat. This venture underscores Adani Energy's commitment to advancing smart metering technologies and reinforcing its presence in the evolving renewable energy landscape

GPS Renewables Secures funds for Nationwide CBG Projects

Mumbai, India: GPS Renewables, a prominent player in clean fuels technology and engineering, has clinched contracts totaling ₹ 2,000 crore for various Compressed Biogas (CBG) projects across India. These projects, also recognized as Renewable Natural Gas (RNG), aim to process 4,000 tonnes per day of agri-residue and energy crops, alongside 300 tonnes per day of Municipal Solid Waste (MSW). The initiative targets a minimum daily CBG output of 350 tonnes, emphasizing landfill reduction and fostering sustainable energy practices.

In collaboration with the Indian Oil Corporation (IOCL), GPS Renewables is set to establish CBG plants and invest in technologies for sustainable aviation fuel production. The company's research arm, GPSR Aavishkar, is actively engaged in advanced research on anaerobic fungi and multi-feedstock compliant digester technologies, showcasing a commitment to innovative solutions in clean energy.

With a focus on addressing India's waste-to-bioenergy challenge, GPS Renewables boasts an order book of ₹ 2,000 crore from leading conglomerates. This underscores its dedication to accelerating the shift from fossil fuels to bio-energy, playing a pivotal role in climate change mitigation.

In the fiscal year 2022-23, GPS Renewables achieved a turnover of ₹ 153 crore, a significant increase from the previous year, with expectations to surpass ₹ 500 crore in turnover for the fiscal year 2023-24

Paradip Port Breaks Speed Record: Fastest among Indian major ports

New Delhi, India: In a remarkable achievement, Paradip Port in New Delhi, India, has set a new record by surpassing 100 Million Metric Tonnes (MMT) of cargo handling for the seventh consecutive year. This milestone was reached in December of the current fiscal year, just 22 days ahead of the previous fiscal year's timeline, showcasing a rapid growth of 9.64% in total cargo throughput. The port, known for its commitment

to excellence and efficiency, achieved the coveted 100 MMT mark in just 262 days.

Notably, the port has introduced various system improvement measures, contributing to its growth. Outbound Iron Ore and Pellet handling have witnessed an impressive 69.03% growth compared to the previous fiscal year. The Port aims to set an all-time record by handling over 145 MMT in the current fiscal year. Key Performance Parameters have also seen improvement, with the port leading in berth productivity at 32,689 MT per day per ship, the highest among all Major Ports in the country.

Paradip Port, under the dynamic leadership of Chairman Shri P.L. Haranadh, is emerging as a coastal shipping hub, marking a historic moment with the initiation of coastal shipping of thermal coal to Maharashtra-based Power Plants on the west coast. The port plans to further expand coastal shipping of thermal coal to other regions on the west coast, solidifying its position as a key player in the industry's growing needs. The Chairman expressed gratitude to Minister Shri Sarbananda Sonowal and acknowledged the collective efforts of officers, employees, industry stakeholders, and government authorities for this incredible success.

Anupam Rasayan Secures Deal with Japanese Chemical Company

Surat, India: Surat-based Anupam Rasayan, a prominent custom synthesis and specialty chemicals firm, has entered into a substantial agreement by signing a Letter of Intent (LoI) valued at over ₹ 500 crore with a leading Japanese chemicals company. The LoI encompasses a revenue of US$ 61 million over the next nine years for the supply of a cutting-edge polymer intermediate, with deliveries set to commence in the calendar year 2024. The specific Japanese firm and the nature of the product remain undisclosed.

The new-age polymer intermediate will be manufactured in Anupam Rasayan's existing and upcoming multipurpose manufacturing facilities. Managing Director, Mr. Anand Desai, highlighted the critical role of the molecule as an intermediate for thermoplastic polymers. These polymers find applications in diverse sectors such as aerospace for structural materials, semiconductor processes, electrical and electronic devices, and high-performance industrial machinery.

Desai expressed the company's commitment to providing a secure supply chain by being fully backward integrated for this molecule, ensuring independence from external geographies for supplies. The signing of the LoI signifies a significant milestone for Anupam Rasayan, reinforcing its position as a trusted supplier of high-end polymer intermediates in the global market.

Exide Industries Strengthens Investment in Exide Energy Solutions Ltd.

Mumbai, India: Exide Industries Limited (EIL) has deepened its financial commitment to sustainable energy solutions with an additional investment of ₹ 39, 99, 99,975/- in its wholly owned subsidiary, Exide Energy Solutions Limited (EESL), through a rights issue. This brings EIL's total investment in EESL to ₹ 1,820.01 crore, showcasing the company's unwavering dedication to advancing the energy sector.

Established in 2022, EESL is strategically positioned to engage in the manufacturing and sale of lithium-ion battery cells, modules, and packs, serving India's burgeoning electric vehicle market and stationary applications. The recent capital infusion is directed towards supporting EESL's Greenfield project and addressing crucial funding requirements for its strategic initiatives.

Importantly, this additional funding does not alter the shareholding percentage of EIL in EESL. The move underscores Exide Industries' vision to establish itself as a frontrunner in the dynamic and rapidly evolving landscape of sustainable and innovative energy solutions.

Exide Industries Limited's stocks recently traded at ₹ 300.90 on the Bombay Stock Exchange, reflecting the positive market response to the company's strategic investments and focus on green technologies.

Japan partners for Green Corridor -Sustainable Shipping-Development

(Kohei Yamamoto, Head of Public Affairs-Japan, Maersk, Dr. Takeharu Yamanaka, Mayor of Yokohama and Masashi Fujii, President of Mitsubishi Gas Chemical signed the MOU)

Tokyo, Japan: A.P. Moller-Maersk (Maersk) has inked a Memorandum of Understanding (MoU) with the City of Yokohama and Mitsubishi Gas Chemical (MGC) to establish green methanol bunkering infrastructure in Yokohama. This aligns with Maersk's net-zero emissions goal by 2040 and signifies a collective commitment to sustainable shipping. As Maersk prepares for the delivery of its 16,000 TEU green methanol-powered vessels from 2024, the collaboration emphasizes the need for global port bunkering infrastructure for methanol.

Yokohama, a leader in Japan's green shipping corridors, will play a vital role in promoting green methanol use. Committed to carbon neutrality by 2050, the city plans to invite partners to join the initiative. Mitsubishi Gas Chemical, contributing over 50% of Japan's methanol supply, brings its production technology to drive sustainability.

The MoU marks a milestone, utilizing Yokohama's port and Mitsubishi Gas Chemical's capabilities. The effort positions Yokohama as a hub for green methanol bunkering, advancing Japan's sustainable shipping initiatives.

Diamond Light Source and Johnson Matthey Extend Collaborate in Electron Microscopy

London, UK: Diamond Light Source and Johnson Matthey have announced a renewed five-year collaboration at the electron Physical Science Imaging Centre (ePSIC) in Harwell, Oxfordshire. ePSIC, the national facility for aberration-corrected electron microscopy, facilitates access to cutting-edge transmission electron microscopes with expert support from Diamond's scientists.

Johnson Matthey will upgrade its aberration-corrected (JEOL) electron microscope with an advanced electron energy loss spectrometer (EELS) from Gatan-Ametek. This spectrometer, paired with a direct detection camera, will offer enhanced compositional and speciation insights, especially for platinum group metals (PGMs), crucial for sustainable technology development.

This investment aligns with ePSIC's commitment to providing unparalleled research facilities. Dr. Elizabeth Shotton, Head of Industrial Liaison at Diamond Light Source, highlighted the facility's role in advancing cleaner energy and improving manufacturing processes. Dr. Elizabeth Rowsell, Chief Technology Officer at Johnson Matthey, emphasized the collaboration's contribution to developing sustainable technologies for the net-zero transition. Prof. Gianluigi Botton, CEO of Diamond Light Source, expressed pride in supporting Johnson Matthey and British businesses, anticipating transformative scientific outcomes.

The collaboration builds on Diamond's dedication to solving significant challenges, operating with 33 beamlines, electron microscopes, and labs. The transformative science expected in the coming years aligns with the facility's mission since the collaboration's initiation in 2014.

Barentz India acquires Radian

Mumbai, India: Barentz has acquired Radian in India, reinforcing its product portfolio with color cosmetic ingredients. The move anticipates substantial growth in the Asia Pacific region. Radian's CEO, Manoj Botadra, and the current team will continue to manage operations, ensuring a smooth transition.

Peter Boone, CEO of Barentz, commented, "We are excited to join forces with Radian. The acquisition aligns with our vision to be at the forefront of delivering high-quality ingredients and solutions for personal care. It benefits our principals and customers by providing access to a broader portfolio of solutions and a deeper pool of expertise. Together, we aim to enhance our offerings and better serve the dynamic needs of the Indian market and beyond."

"The deciding factor to join Barentz was the global nature of the business which creates tremendous opportunities to strengthen and expand our offering in India. Barentz and Radian share the same entrepreneurial DNA, which makes it the best possible new home for our stakeholders. We are confident that this strategic move will amplify our reach and elevate our commitment to excellence in the industry," said Manoj Botadra, CEO of Radian.

The acquisition underscores Barentz's dedication to the Indian market and is set to unlock strategic growth opportunities throughout the Asia Pacific region. Both firms are devoted to achieving a smooth transition.

GACL and Vedanta Ltd Ink MoU for Joint Business Ventures

Gujarat, India: In a significant move, Gujarat Alkalies and Chemicals Ltd (GACL) has entered into a Memorandum of Understanding (MoU) with Vedanta Ltd (Aluminium Business) in Gujarat, India. The MoU aims to explore diverse business opportunities within the realms of Caustic-Chlorine and other related ventures. Recognizing the potential synergies, both GACL and Vedanta Aluminium intend to collaborate, leveraging their complementary skills and strengths.

The agreement underscores a shared vision to enhance the value proposition for both entities, emphasizing a cooperative approach. The companies plan to delve deeper into potential areas of cooperation, with the goal of mutually beneficial resource pooling. Under the MoU, GACL and Vedanta Ltd have preliminarily agreed to jointly investigate business prospects, considering avenues such as joint venture projects or contractual arrangements that align with their common interests.

This strategic collaboration signifies a proactive step towards maximizing opportunities in the industrial landscape, fostering a partnership that could potentially result in innovative and mutually advantageous ventures for both GACL and Vedanta Ltd (Aluminium Business).

Neogen Ionics Plans Electrolytes and Salt Facility Establishment in Dahej

Gujrat, India: Neogen Ionics Ltd., a wholly-owned subsidiary of Neogen Chemicals Ltd., has successfully completed the acquisition of approximately 65-acres of land in Pakhajan, Dahej PCPIR, and Gujarat, as a part of its expansion strategy and for establishing a Greenfield project for battery materials.

In the initial phase the plant will manufacture 30,000-tpa of electrolytes and 4,000-tpa of electrolyte salts and additives; it is slated to become operational in the second half of 2025

The electrolyte plant will utilize technology licensed from MUIS, a joint venture between Mitsubishi Chemical Corporation (MCC) and UBE Corporation, both integral parts of the Mitsubishi Chemical Group, a renowned Japanese conglomerate. The electrolyte salts will, however, be produced using Neogen's in-house technology, leveraging its 35 years of expertise in manufacturing lithium salts.

The plants will meet not only the demand of lithium-ion cell manufacturers in India, but also cater to the expanding international OEM demand.

Mr. Haridas Kanani, Chairman and Managing Director, Neogen Ionics, expressed satisfaction with the timely completion of land acquisition, emphasizing the strategic importance of the project for the battery materials sector. The collaboration with MUIS, he said, in finalizing the design, will enable the company to commence operations aligned with domestic and global customer timelines.

NHPC to invest ₹ 4,000 crore in Kuppa Hydro Storage Project in Gujarat

Gujrat, India: NHPC, India's prominent hydropower company, has taken a stride towards sustainable energy by signing a Memorandum of Understanding (MoU) with Gujarat Power Corporation Limited, a venture of the Government of Gujarat. The agreement focuses on NHPC's investment in the Kuppa Pumped Hydro Storage Project (750 MW), marking a promising start to 2024. The MoU signing ceremony took place at the Secretariat in Gandhinagar, Gujarat, under the "Vibrant Gujarat" initiative.

In the presence of Shri Bhupendra Patel, Hon'ble Chief Minister of Gujarat, and Shri Kanubhai Desai, Hon'ble Energy Minister, Government of Gujarat, the MoU was formalized by Shri Arun Mahesh Babu (IAS), Managing Director of GPCL, and Shri V.R. Srivastava, Executive Director of Renewable Energy and Green Hydrogen at NHPC. This collaborative effort aligns with the national goal of achieving 500 GW of renewable energy by 2030 and the "Net Zero" target by 2070.

Under the MoU, NHPC commits to invest around ₹ 4,000 crores in the proposed 750 MW Kuppa Pumped Hydro Storage Project in Chhota Udaipur, Gujarat. The project not only addresses the imperative for clean energy but also anticipates the creation of substantial employment opportunities, providing an economic boost to the local area. NHPC presently boasts a total installed capacity of 7,097.2 MW of renewable energy and is actively involved in the construction of 15 projects with a combined installed capacity of 10,449 MW, reinforcing its commitment to sustainable power generation.

NHAI signs MoU to develop Green Cover Index

New Delhi, India: The National Highways Authority of India (NHAI) has entered into an agreement with the National Remote Sensing Centre (NRSC) to develop a "Green Cover Index" for the extensive National Highways network in India, as per an official statement on Wednesday. Since the initiation of the Green Highways Policy in 2015, greening highway corridors has been a key focus for the Ministry of Road Transport and Highways (MoRTH) and NHAI. Currently, plantation monitoring relies on site visits by field personnel.

Leveraging emerging technologies, the NRSC will utilize high-resolution satellite imagery for a comprehensive pan-India estimation of the "Green Cover Index" for National Highways. This initiative aims to enhance in-situ data collection, supplement plantation management, and facilitate targeted interventions in areas lacking sufficient green cover.

Headquartered in Hyderabad, NRSC is mandated for ground stations, satellite data reception, and geospatial services. Successful pilot projects for estimating green cover along National Highways have already been conducted as proof of concept.

The project's overarching goal is to capture the Green Cover Index region-wise for National Highways in the initial assessment cycle. Subsequent annual cycles will focus on scientifically estimating green cover growth patterns, enabling timely and periodic interventions. The generated index metrics will facilitate comparison, ranking, and granular insights for individual National Highway projects/packages, promoting effective green infrastructure management.

IGX Partners with S&P Global for Long-Duration Gas Contracts

Mumbai, India: The Indian Gas Exchange (IGX) has inked a data licensing pact with S&P Global Commodity Insights, integrating S&P Global's Platts benchmarks into IGX's forthcoming Long-Duration Contracts (LDCs). The agreement was formalized during IGX's third-anniversary event, facilitating the use of S&P Global's benchmarks like Platts Japan Korea Marker (JKM), Platts West India Marker (WIM), and Platts Dated Brent in settling LDCs.

This collaboration aims to augment market liquidity and foster innovation in the Indian gas sector by incorporating globally recognized benchmarks. IGX's LDC contracts, ranging from three months to one year, offer market participants flexibility in securing their natural gas needs. Traders can choose between fixed-price terms or prices linked to international Platts

benchmarks, providing a competitive, transparent, and flexible platform on IGX.

Rajesh Mediratta, MD & CEO of IGX, highlighted the milestone's potential to offer unprecedented flexibility and price hedge to trading participants. Saugata Saha, President of S&P Global Commodity Insights, emphasized the importance of data-licensing alliances that contribute to growth in vital markets like India. S&P Global Commodity Insights is a leading provider of information, data, and benchmark prices for commodities, energy, and energy transition markets.

India accelerates Hydrocarbon Exploration with OALP

New Delhi, India: The Ministry of Petroleum and Natural Gas in India achieved significant milestones in the hydrocarbon sector by signing contracts for 10 blocks under the Open Acreage Licensing Policy (OALP) Bid Round-VIII and three Coal Bed Methane (CBM) Blocks under Special CBM Bid Round-SCBM 2022. Minister Hardeep Singh Puri presided over the signing ceremony, emphasizing its importance in ensuring India's energy security. Simultaneously, the OALP-IX Bid Round was launched, offering 28 blocks covering approximately 1, 36,596 sq. km for international competitive bidding. The bid round included blocks in hydrocarbon-rich basin areas previously off-limits for Exploration and Production (E&P). Minister Puri highlighted that only 10% of India's sedimentary basin area was under active exploration, and initiatives like OALP-IX aimed to increase this to 16% by the end of 2024. The signed contracts under OALP-VIII represented investments of around US$ 233 million, while the CBM blocks involved committed exploration work programs of about US$ 7.4 million.

IWDC Council Allocates ₹ 45,000 Crore for River Cruise Tourism

Kolkata, India: In a ground breaking move, the Inland Waterways Development Council (IWDC) in Kolkata, led by Union Minister Sarbananda Sonowal, committed a staggering investment of ₹ 45,000 crore to bolster river cruise tourism development in India. Out of this ₹ 35,000 crore is earmarked for cruise vessels, and ₹ 10,000 crore will be dedicated to cruise terminal infrastructure by 2047. Additionally, an investment of ₹ 15,200 crore, agreed upon at the Global Maritime India Summit (GMIS), is set to boost inland waterways' cargo trade, projecting a growth of over 400% at 500 Million Tonnes Per Annum (MTPA) by 2047. At the IWDC, Minister Sonowal launched the 'Harit Nauka' guidelines and the 'River Cruise Tourism Roadmap, 2047'. The roadmap includes plans for an additional 26 waterways for river cruise tourism, increasing the number of cruise circuits with night stays from 17 to 80.

In a bid to enhance infrastructure, IWDC aims to increase the number of river cruise terminals from 15 to 185. With these initiatives, the cruise tourism traffic is projected to increase significantly, reaching 1.20 lakh with night stays and 15 lakh without night stays by 2047. The IWDC event saw the signing of MoUs worth ₹ 15,200 crore to strengthen capacity in inland waterways.

Serentica Renewables Secures finances for 530 MW Renewable Energy Projects

Mumbai, India: Serentica Renewables has successfully secured ₹ 3,500 crore in financing for its 530 MW round-the-clock (RTC) renewable energy projects in India. The substantial funding comes from a consortium of six major banks, including international entities such as Rabobank, MUFG Bank, and Société Générale, alongside Indian lenders like YES Bank, Export-Import Bank of India, and India Infrastructure Finance Company (IIFCL). Rabobank plays a pivotal role as the

sole structuring bank for this noteworthy renewable transaction, focusing on the commerce and industry (C&I) segment.

This financial arrangement facilitates Serentica's development of hybrid renewable energy projects situated in Rajasthan and Maharashtra. The primary objective is to provide clean energy to Hindustan Zinc, thereby replacing 24% of their coal-based power consumption with green energy, leading to a significant reduction in their carbon footprint.

Serentica Renewables has a committed goal to develop four gigawatts (GW) of renewable energy capacity nationwide, with the intention to deliver over nine billion units of clean energy annually and offset 8.5 million tonnes of CO2. Looking ahead, the company aspires to supply more than 40 billion units of clean energy each year, effectively displacing 37 million tonnes of CO2 emissions.This financing milestone follows closely after Serentica Renewables' recent debt raise of ₹ 5,600 crore from major players in the power sector, PFC & REC.

A 225 MW wind energy project awarded to Suzlon

New Delhi, India: Renewable energy solutions provider Suzlon Group has secured a significant 225 MW wind energy order from Everrenew Energy. The project will involve the installation of 75 wind turbine generators (WTGs) featuring Hybrid Lattice Tubular (HLT) towers, each with a rated capacity of 3 MW. The deployment will span Everrenew Energy's sites in Vengaimandalam, Trichy district, and Ottapidaram, Tuticorin district, both located in Tamil Nadu. Suzlon's larger rated 3 MW, S144-140m turbines from the 3.15 MW product series will be utilized for this order.

Girish Tanti, Vice Chairman of Suzlon Group, highlighted the project's significance in serving the commercial and industrial (C&I) segment of the Indian market, aligning with national renewable energy targets. Suzlon will not only supply the wind turbines and oversee the project, including commissioning, but will also provide comprehensive operations and maintenance services post-commissioning.

JP Chalasani, CEO of Suzlon Group, emphasized the project's aim to cater to captive needs and target the C&I consumer segment, contributing to increased renewable energy penetration in India. The electricity generated from this project is expected to meet the captive needs of around 1.85 lakh households and reduce approximately 7.31 lakh tonnes of CO2 emissions annually.

R Venkatesh, CEO of Everrenew Energy, expressed confidence in Suzlon's reliable technology and successful track record, highlighting the collaborative partnership evident in repeat orders.

Hyundai and Kia Partner with Gore for Next-Gen Fuel Cells

Korea & USA: Hyundai Motor Group, the South Korean automotive giant, has entered into a partnership with W. L. Gore & Associates Inc., a prominent US materials science company, to collaboratively develop a critical material for hydrogen fuel cells. The collaboration involves Hyundai Motor Co. and Kia Corp., the two car-manufacturing units under the automotive group, working alongside Gore to advance polymer electrolyte membrane (PEM) technology for next-generation hydrogen fuel cells used in commercial electric vehicles.

PEM is a crucial component in hydrogen fuel cells, facilitating the conduction of protons between electrodes to generate the electrical current that powers fuel cell electric vehicles (FCEVs). Through the partnership, Hyundai and Kia intend to combine Gore's pioneering PEM technology with their advanced fuel cell expertise to create next-generation fuel cell systems for a range of applications, including passenger cars, commercial vehicles, and non-automotive sectors.

This collaboration builds upon a longstanding relationship between Hyundai, Kia, and Gore spanning over 15 years in the field of fuel cells. The focus will be on jointly developing optimized fuel cell systems, particularly targeting commercial vehicles, with a specific emphasis on improving performance and durability.

China's BTR to invest in Moroccan Cathode Facility

China & Morocco: BTR New Material Group, a subsidiary of China Baoan Group specializing in electric vehicle battery components, plans to invest US$ 500 million in establishing a new cathode manufacturing plant in Morocco. The facility is expected to have an annual production capacity of 50,000 tons.

While BTR New Material Group will spearhead the investment and construction aspects, operational duties will be overseen by a Moroccan entity created by Bnuo International Holding, another subsidiary of BTR. Morocco is becoming a focal point for electric vehicle battery production, attracting interest from prominent Chinese industrial players.

This initiative follows Morocco's recent agreement with Guchen Hi-Tech, a Sino-European electric mobility conglomerate, involving an estimated US$ 6.4 billion in investments. Other Chinese companies like CNGR Advanced Material Company and Guangzhou Tinci Materials Technology have also committed significant funds to projects in Morocco, highlighting the country's emerging status in the electric vehicle sector.

Porus Labs Partners with Radhesh Welling

Hyderabad, India: Porus Labs, a prominent technology-driven agricultural and specialty chemicals manufacturer, has joined forces with Mr. Radhesh Welling, who will assume the role of Chief Executive Officer and join the company's board. Mr. Welling, with nearly three decades of experience in leading specialty chemicals firms globally, will leverage Porus' strengths in research, process innovation, and customer relationships to drive growth in new products and chemistries. Formerly the Managing Director and Group CEO at Navin Fluorine, where he spearheaded strategic expansion, Mr. Welling expressed excitement about partnering with Bain Capital to deliver significant value to international customers. The collaboration aims to invest in strengthening and expanding the platform, fostering new chemistries, and accelerating customer growth. Pawan Singh and Rishi Mandawat, Partners at Bain Capital, emphasized their alignment with Porus Labs' vision and the unique opportunity to partner with Mr. Welling for global growth in the specialty chemicals sector. Established in 1994 in Hyderabad, Porus Labs has evolved into a multi-faceted business, initially focusing on Sulpha-based drugs and later expanding into supporting API manufacturers and scaling agro-chemical capabilities.

Tower Semiconductors Eyes BC Jindal Group as partner for Chip Fabrication

Mumbai, India: Israel-based Tower Semiconductors is making a second attempt to establish a semiconductor fabrication facility for 65 nanometer (nm) and 40 nm chips in India. The company is considering the BC Jindal Group as a potential partner for this venture, focusing on chip manufacturing.

This initiative follows Tower Semiconductors' initial effort, which involved a joint venture with the International Semiconductor Consortium (SIMC) Analog Fab. The earlier project aimed to set up a chip fabrication unit with a proposed investment of US$ 3 billion but faced challenges, leading to its discontinuation.

The current proposal has sparked tensions with Next Orbit Ventures, claiming exclusion from the new alliance despite a previously signed non-disclosure agreement (NDA) and a pre-existing agreement with Tower Semiconductors. The renewed push into the Indian market underscores the strategic importance of semiconductor manufacturing, aligning with global efforts to enhance chip production capabilities.

SPIC Group's INR 1,900 Crore growth and sustainability

Chennai, India: Southern Petrochemical Industries Corporation Ltd (SPIC) unveiled an ambitious investment plan of ₹ 1,900 crore at the Tamil Nadu Global Investors Meet 2024. The Memorandum of Understanding (MOU) signed with the state government outlines strategic investments over the next two years across SPIC Ltd, Greenstar Fertilizers Ltd, and Tuticorin Alkali Chemicals and Fertilizers Ltd. The visionary leadership of Mr. Ashwin C. Muthiah, Chairman, SPIC, drives this expansion initiative.

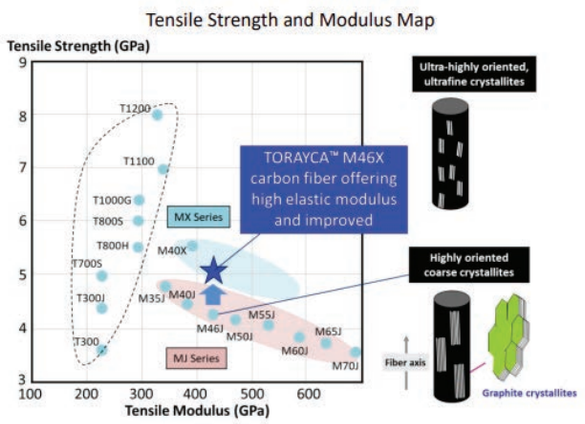
SPIC's investment focuses on revamping the Urea plant, expanding capacity, and establishing a 150 MTPD Green Ammonia plant with an allocation of ₹ 970 crore. The commitment to farmers' economic empowerment is evident in the dedication to agricultural community service.

Greenstar Fertilizers Ltd allocates ₹ 640 crore for a Water Soluble Fertilizer Mixing plant in Chennai, a Sulphuric Acid plant, and refurbishing DAP I and II plants in Thoothukudi. This investment follows the inauguration of the first WSF facility in Thoothukudi, operated entirely by women employees.

Tuticorin Alkali Chemicals and Fertilizers Ltd (TFL) directs ₹ 290 crore to establish a Soda Ash and Ammonium Chloride Plant in Thoothukudi, building upon its 2023 achievement of being the first to manufacture Green Soda Ash and Green Ammonium Chloride.

Toray Develops TORAYCATM M46X Carbon Fiber

Tokyo, Japan: Tokyo-based Toray Industries, Inc. introduced TORAYCATM M46X carbon fiber, surpassing its predecessors by 20% in strength within the TORAYCATM MX series, while maintaining a high tensile modulus. This breakthrough reduces the weight of carbon fiber-reinforced plastic materials, minimizing environmental impact. Traditionally, enhancing strength while preserving tensile modulus poses challenges, especially for applications in sporting and leisure goods where both qualities are crucial. TORAYCATM M46X was developed through advanced structural control technology, achieving ultrafine, ultra-high orientation in the graphite crystallite structure inside fibers. The result is a carbon fiber over 20% stronger than conventional materials, still retaining its tensile modulus.



Toray plans to deploy TORAYCATM M46X prepreg, utilizing proprietary NANOALLOY®1 microstructure control technology in the resin matrix. This innovation enhances compressive strength, boosting stiffness while reducing product weight and expanding design flexibility. Toray's commitment to developing high-performance carbon fibers began with TORAYCATM M40, evolving into the TORAYCATM MX series, with TORAYCATM M46X as the latest achievement. Aligned with its corporate philosophy, Toray aims to contribute to society by creating new value through continued advancements in TORAYCATM carbon fiber and prepreg performance and process ability. ■

1st unit of SJVN's 60 MW NMHEP starts commercial generation

New Delhi, India: SJVN's Naitwar Mori Hydropower Project has flipped the switch, bringing 30 MW of clean energy online. This milestone marks a big jump for the state, boosting SJVN's total capacity to 2122 MW.

The project, nestled on the River Tons, boasts two 30 MW units, with the second one expected to join the party soon. Together, they'll generate a whopping 265.5 million units of electricity annually, enough to power countless homes and businesses.

But SJVN isn't just about megawatts. They're committed to powering progress, providing 12% free electricity to Uttarakhand and supporting project-affected families with monthly electricity credits. This win-win approach ensures shared benefits and sustainable development.

Naitwar Mori is just one step in SJVN's ambitious journey. They're aiming for 12,000 MW by 2026 and a remarkable 50,000 MW by 2040. With projects like this leading the way, Uttarakhand and India can shine brighter, powered by clean, renewable energy.

BCCL's Madhuband Washery starts commercial operation

New Delhi, India: Bharat Coking Coal Limited (BCCL), a subsidiary of Coal India, has announced the initiation of commercial operations at its 5 million tonnes per annum, Madhuband Washery, as officially released.

The washery will help improve the local supply of washed coking coal to the steel sector and cut imports, thereby reducing the outflow of foreign exchange.

The coking coal washery, is one of the largest coking coal washeries in the country. It started commercial operations in December 2023, as stated by the Coal Ministry.

"The commencement of commercial production at this washery reflects BCCL's consistent effort towards import substitution of coking coal in India, a crucial step considering the current challenges faced by the steel industry due to the soaring prices of imported coking coal," the ministry said.

Furthermore, this initiative aligns with the goal of import substitution by augmenting the supply of indigenous washed coking coal at competitive prices, propelling the growth of the economy, it said.

SJVN's 60 MW Naitwar Mori hydroelectric project in Uttarkashi is now fully operational

Shimla, India: Miniratna PSU SJVN Limited has made its 60 MW Naitwar Mori hydroelectric project in Uttarkashi, Uttarakhand, fully commercially operational as the second unit of the project with a capacity of 30 MW began supplying electricity to the national power grid. "Company has successfully synchronised the Second Unit of 60 MW Naitwar Mori Hydro Electric Project (NMHEP) with the National Grid," SJVN said in a regulatory filing to the stock exchanges this month.

SJVN's Naitwar Mori hydroelectric project will supply 12% power to Uttarakhand Naitwar Mori hydroelectric project is a run-of-the-river project with two generating units of 30 MW each. The first unit had started generating power commercially recently in November, it added. It is located on River Tons, a major tributary of Yamuna in Uttarkashi district of Uttarakhand.

The project will generate 265.5 million units of electricity annually. The company has constructed a 37-km 220 KV transmission line for the evacuation of power from Naitwar Mori HEP -- from Bainol to Snail. After the commissioning of the project, 12 percent free electricity will be supplied to Uttarakhand as royalty. In addition, each project-affected family will be provided with an amount equivalent to the cost of 100 units of electricity per month for ten years.

The project will usher in an era of overall development of the area, with infrastructure development and generation of direct and indirect employment. Treading on the path of impeccable progress, the company, a leading power CPSU, is dedicated to contributing to the energy goals of the central government," said SJVN. It has set a target of achieving installed capacity of 12,000 MW by 2026 and 50,000 MW by 2040.

Karnataka attracts 62 investment projects worth over ₹. 3,000 crore

Bengaluru, India: The Karnataka government has approved 62 industrial investment proposals worth ₹. 3,607.19 crore with an employment generation potential of 10,755 within the state. The proposals were cleared by the State Level Single Window Clearance Committee, headed by Large and Medium Industries and Infrastructure Development Minister M B Patil at a meeting.

Eight of them envisaged more than ₹. 50 crore investment, totaling ₹. 2,088.44 Crore. These hold the potential to create 6,360 jobs, the minister's office said in a statement.

Some of the top investors include Texcon Steels, Hundri Sugars and Ethanol Private Ltd, Bren Life Sciences, Alpine Ethanol, Virupaksha Laboratories and Qualcomm India.

Of the total 62 proposals, 51 investment projects are between ₹. 15 Crore and ₹. 50 Crore, totaling ₹. 941.40 Crore, promising employment generation potential of 4,395 within Karnataka, the statement said.

HPCL to commission Chhara LNG terminal in 2-3 months

New Delhi, India: Hindustan Petroleum Corporation Ltd (HPCL) is planning to begin operations at the 5 million tonne a year Chhara LNG import terminal in Gujarat in the next couple of months.

The company has already received offers from 6-7 parties to hire capacity. The terminal was mechanically completed in March, but its commissioning was delayed as a 40-km pipeline connecting it to an existing network meant for sales to consumers was not yet ready.

"We will commission the LNG terminal in the next couple of months," HPCL Director (Marketing) Amit Garg said. The company has been a late entrant into the gas business and built the facility at Chhara in Gir-Somnath district of Gujarat to receive natural gas that has been super cooled to a liquid state in cryogenic ships. The company was looking to lease capacity of 3 million tonne per year to other companies for a period of more than 10 years.

ONGC to start commercial oil production from KG block by May 2024

New Delhi, India: State-controlled Oil and Natural Gas Corporation (ONGC) will in May next year start commercial production of crude oil from its much-delayed flagship deep sea project in Krishna Godavari basin, as stated to Rajya Sabha. In a written reply to a question, Minister of State for Petroleum and Natural Gas Rameswar Teli said 'ONGC's KG basin project, KG-DWN-98/2, is in "challenging geology".

Delays have occurred due to multiple challenges and issues in actual project implementation such as subsurface geological issues, shifting of well locations and surface facilities/processing platform, delays and disruption in project supply chain for vendors spread across multiple countries due to Covid-19 pandemic and challenging weather conditions. The KG-DWN-98/2 or KG-D5 block, which sits next to Reliance Industries' KG-D6 block in the KG basin, has a number of discoveries that have been clubbed into clusters.

Located 35 km off the coast of Andhra Pradesh in water depths ranging from 300-3,200 metres, the discoveries in the block are divided into Cluster-1, 2 and 3. Cluster 2 is being put to production first. "Cluster-I consists of three discoveries. FDPs of 2 discoveries were approved in 2019. This project is currently in the development stage," he said. "In Cluster-II, commercial production from one gas field has already commenced from March 2020 and commercial production of crude oil is scheduled for May 2024. The project is likely to achieve full completion by 2024." In Cluster-III, there is one ultra-deep water gas discovery which would be the second deepest hydrocarbon discovery in the world, when monetised. "The FDP is scheduled to be submitted by January 2026," he said. As per original plans, oil production from Cluster-II should have begun by November 2021, but was delayed because of the pandemic.

Indian Oil's Panipat refinery expansion to be completed in Dec 2025

Mumbai, India: (ICIS) State-owned Indian Oil Corp (IOC) has pushed back completion of its Panipat Refinery and Petrochemical Complex expansion by more than a year to 2025, with the project cost raised by 10% ₹. 362.3bn ($4.4bn).

The refinery's capacity is being expanded to 25m tonnes/year from the current 15m tonnes/year and build a 450,000 tonne/year polypropylene (PP) plant among other downstream units at the site.

IOC now expects to complete the expansion project by December 2025, against its earlier target of September 2024, the company said in a disclosure to the Bombay Stock Exchange (BSE).

The company did not provide any reasons for the extension in the completion deadline.

In July, IOC selected engineering and construction firm McDermott for the expansion project, which includes phase II expansion of the naphtha cracker at the site, along with downstream PP and new ethylene derivative units.

McDermott is also executing IOC's 120,000 tonnes/year maleic anhydride project at the complex. Other

chemicals including Butanediol (BDO) used to produce engineering-grade plastic and biodegradable fibers, and tetra hydro furan (THF) used in adhesives and vinyl film will also be produced in Panipat.

IOC is also building a 60,000 tonnes/year polybutadiene rubber (PBR) plant and a 387,000 tonne/year styrene monomer unit at the site.

Odisha Govt approves projects worth ₹. 4, 804 crore

New Delhi, India: Odisha's industrial engine is roaring! The state government approved 19 diverse projects worth a whopping ₹4,804 crore, promising to spark a 17,553-job bonanza across 10 districts. From textiles and steel to chemicals, food, and IT, these investments showcase Odisha's manufacturing muscle, rich mineral resources, and commitment to tech advancements. Welspun Living's ₹200 crore textile facility and Tata Steel's ₹735 crore service center lead the charge, creating thousands of jobs. Other highlights include Rungta Paints' ₹991 crore manufacturing unit and Summa Real Media's ₹226 crore IT complex, further fueling the state's economic engine. This comprehensive development push extends to renewable energy with GAIA Neo Energy's ₹87 crore biogas plant. With infrastructure and skilled workforce development on the horizon, Odisha is poised for an industrial boom, one project at a time.

Surface Coal Gasification Projects under Execution

Odisha, India: Odisha is blazing a trail in India's clean coal revolution with its Surface Coal Gasification (SCG) projects. The state-owned CIL spearheads this effort, with the Talcher Fertilizer Plant leading the charge. This joint venture aims to produce 1.27 million tons of urea annually, utilizing high-ash coal and pet-coke. Construction is in full swing, with progress exceeding 50% for both physical and financial aspects.

Beyond Talcher, CIL has ambitious plans for pithead gasification plants at ECL, MCL, and WCL mines. Pre-feasibility reports for coal-to-SNG and coal-to-ammonium nitrate projects have already been approved, signifying the commitment to diversify energy sources. NLCIL's Lignite to Methanol project adds another layer to this clean coal ecosystem.

The government is playing a crucial role by incentivizing private sector participation. A 50% revenue share rebate for coal used in gasification and a dedicated auction window for new plants are just some of the initiatives. Environmental concerns are also addressed through mandatory environmental clearances, ensuring responsible development.

Odisha's SCG projects are not just about cleaner energy; they represent a leap towards a greener and more sustainable future. By creating economic opportunities while mitigating environmental impact, these initiatives position Odisha as a frontrunner in India's energy transition, paving the way for a brighter future powered by clean coal solutions.

Successful Compensatory Afforestation at Jamuna Open Cast Project, SECL

Madhya Pradesh, India: The Ministry of Coal has taken a pioneering step towards environmental stewardship with its sustained reclamation and afforestation initiative, aiming to minimize the ecological footprints of coal mining. This initiative exemplified by the success of the Jamuna Open Cast Project (OCP) at South Eastern Coalfields Limited (SECL), which commenced operations, in Anuppur District, Madhya Pradesh.

The Jamuna OCP, having served its purpose, ceased mining activities in June 2014, due to resource depletion. Following this, a meticulously planned mine closure was initiated. According to recent satellite data, 88.07% of the quarry area has been successfully reclaimed, showcasing the Ministry's commitment to sustainable coal mining practices.

A substantial portion of the reclaimed land, covering 672 hectares, has been dedicated to afforestation efforts. Notably, 131 hectares of this afforested land are strategically positioned to serve as a crucial groundwater recharge area, contributing to the broader goal of water conservation.

The Ministry has proposed 579 hectares of reclaimed land under the Accredited Compensatory Afforestation (ACA) program. This forward-looking approach ensures that the land, once utilized for coal mining, is transformed into a green haven that not only restores biodiversity but also aligns with the larger environmental conservation objectives.

This initiative is a testament to Coal Ministry's commitment to sustainable development and responsible resource management. By adopting such comprehensive measures, the Ministry sets a precedent for the industry, demonstrating that economic activities like coal mining can coexist with environmental preservation.

Lush green Plantation of Jamuna Open cast project, SECL

Plant to produce construction-grade sand to become operational next month: NLC India

New Delhi, India: State-owned lignite producer NLC India Limited (NLCIL) said its proposed plant for manufacturing construction-grade sand using mine overburden is expected to begin operations by January-end 2024.

The plant is expected to produce civil construction-grade sand from mine overburden -- wastes generated during mining operations. Sand manufactured from mining wastes is important in view of the scarcity of natural sand. "This plant is expected to produce civil construction Grade M-sand of 2.62 lakh cubic metre per year from mine overburden...The plant is expected to be operationalised by end of January 2024," the public sector enterprise said in a stock exchange filing.

Similar and high capacity plants will be installed in other mines of Neyveli (Tamil Nadu) in due course, the company said. NLC India Ltd's CMD Prasanna Kumar Motupalli said that the contract has already been awarded for execution and this environment-friendly initiative would be further expanded in future.. ■

How sustainable supply chains are driving business transformation

A large proportion of the socio-environmental impact that organisations cause, including the overall impact on the climate, comes from their supply chains. This can be as high as 90% or even more. As per "CDP 2020 Global Supply Chain Report", the greenhouse gas (GHG) emissions from an organization's supply chain can be as high as 11.4 time of its own operational greenhouse gas emission. Therefore, as more companies take urgent actions and set ambitious goals towards sustainability and decarbonization in order to mitigate the adverse impacts of climate change, these figures suggest, supply chains have to be an integral part of their sustainability agenda. Without focusing on the sustainability of their supply chains, the embedded socio-environmental footprint of the procured materials/ services for an organization cannot be managed and this may lead to serious challenges for organizations to progress well on their sustainability commitments.

Earlier, many companies were primarily concerned with their own operational impact on the environment, on its stakeholders, and on the society at large. The solutions for making the organizations sustainable were also focused more around their operational impacts. However, the understanding that supply chain operations can significantly influence the environment, society and corporate governance has triggered a fundamental shift in how organisations approach sustainability and responsible business.

With multiple adverse evidence of global warming, various companies are setting their climate goals around reducing greenhouse gas (GHG) emissions, conserving natural resources and protecting ecosystems, there is a surge in Environmental, Social and Governance (ESG) factors being incorporated into supply chain management. The global ESG guidelines and frameworks have significant focus on design of sustainable supply chains in order to ensure product stewardship and long-term value creation for the suppliers and the consumers. Companies across sectors have therefore started embedding sustainability considerations in their supply chains - to create a sustainability driven DNA for their organizations as well as a sustainable ecosystem, and also comply with the requirements of the global standards/frameworks.

Several other factors are tilting the scales towards enterprises with sustainability strategies. Increasingly companies are acknowledging the fact that sustainability goes beyond mere compliance and risk management, and that it serves as a competitive advantage. Many investors, too, consider the long-term sustainability, and ethical impact of the companies they are investing in. Growing stakeholder expectations and recognition of the potential advantages for businesses have driven companies to adopt ESG as a strategic priority. They perceive ESG as a way to foster innovation, enhance reputation, achieve cost-saving and create long-term value.

One of the sectors to have gained significant attention under the ESG lens is chemicals. It is one of the largest industrial energy consumers and an industry sub-sector in terms of direct CO2 emissions. Therefore, it is vital to manage the entire supply chain of the chemical industry, which entails managing the full lifecycle of products, starting from raw material sourcing to production, distribution, and end-of-life management.

Easier said than done but a global chemical major has implemented various sustainable supply chain practices, and developed a "Sustainable Solution Steering Methodology", which assesses the sustainability performance of their products. The company also actively engages with suppliers to promote sustainable practices, conduct audits, and provide training and support to help them improve their sustainability maturity.

Currents trends

Several factors are at play in supply chain management, and each has a critical role in making it sustainable and seamless. As organisations address climate change, there is a need to actively measure and manage GHG emissions across supply chains. To this end, businesses

are setting science-based targets, incorporating renewable energy sources, optimising transportation routes, and promoting energy-efficient practices. A US-based multinational retail corporation's initiative has set the target of reducing 1 billion metric tonnes of GHG emission from its supply chain by 2030. Similarly, there are examples of organizations recommending their suppliers to follow similar standards on energy and emissions management, water management, waste management, health and safety management, and promote diversity and inclusion, equal opportunity etc. Many organizations have also started collecting information on supplier's sustainability practices.

But even the best laid plans can fail if the data lacks credibility. To ensure transparency, companies are employing technological solutions such as blockchain and traceability platforms to achieve comprehensive visibility throughout their supply chains. The integration of technology enables improved risk management, identification of inefficiencies, and effective resolution of environmental and social concerns. For instance, there are blockchain-based platforms that empower consumers to trace the origins and trajectory of food products, fostering transparency and sustainability within the food supply chain. Many organisations have seen positive results from such interventions. For high end speciality products, global consumers have also started demanding such information in order to ensure that they consume products which are made sustainably, and procured from organizations that promote good governance and sustainable behaviours.

Climate change is a reality for the entire world and mitigatory measures need scale and speed. It is, therefore, crucial that sustainable practices are built as well as implemented in collaboration with stakeholders. Various collaborative initiatives and multi-stakeholder partnerships are being established to address intricate supply chain challenges such as deforestation and carbon emissions. Such collaborations have enabled knowledge sharing, pooling of resources and collective action in mitigating the impact of climate chain. The Fashion Industry Charter for Climate Action, initiated by the United Nations, brings together stakeholders from the fashion industry to collectively tackle climate change impacts and commit to sustainable practices.

When discussing sustainability, one cannot ignore the importance and relevance of adopting circular economy. With the aim to reduce, reuse and recycle, companies are redesigning products, implementing closed-loop systems, and emphasising recycling and waste reduction across the entire value chain. Embracing circularity helps minimise resource consumption, which also saves on cost; decrease waste generation, and establish a more sustainable and resilient supply chain. A multinational electronics company, for example, has successfully implemented a closed-loop recycling program to recover valuable materials such as gold from used products and reintegrating them into manufacturing. The effect is widespread, from lower natural capital costs to reduced social and environmental impact of mining.

While environmental considerations have traditionally taken centre-stage in ESG discussions, the social aspect is now receiving greater attention. There is increasing emphasis on matters such as diversity and inclusion, fair labour practices, human rights, and community engagement.

The road ahead

In building resilient and adaptable supply chains, ESG considerations will continue to play a crucial role as by incorporating these principles, organisations can enhance supply chain agility, adaptability, and sustainability. However, to reach that level it is imperative for them to assess and address risks associated with climate change, resource scarcity, social disruptions, and technological advancements.

Technology has much to offer in the form of artificial intelligence, Internet of Things (IoT), data analytics and more. These enable more advanced monitoring and measurement of ESG performance across supply chains. Integration with different functions will facilitate real-time decision-making, predictive analytics and improved risk management. For example, IoT sensors can provide instant data on energy consumption, waste generation, and worker safety, empowering organisations to take proactive measures.

Even as the corporate world moves forward on its sustainability agenda, the regulatory landscape is also changing. More governments and regulatory bodies are expected to introduce stricter regulations and reporting requirements related to ESG practices in supply chains. Notably, some countries have taken the taxation route to further the sustainability agenda. Some developed countries are imposing taxes on imported goods based on the latter's carbon footprint. This tax aims to reduce

carbon leakage while incentivizing companies to adopt more sustainable practices and reduce carbon footprint. This is especially relevant for companies with operations spread across geographies. And this is even significant for investors as they continue to prioritise ESG considerations in their investment decision-making.

Along with internal sustainability targets, external factors such as consumers demand, investors evaluation etc. are also driving organisations to further embed the principles into their supply chain strategies, ensuring overall compliance and accountability.

Conclusion

Sustainability in supply chain management is set to witness advancements in technology, a heightened focus on social impact, increased regulatory and investor influence, and a greater emphasis on supply chain resilience. Organisations will create more resilient and sustainable supply chains, benefiting not only their bottom line but also the society and environment. For any organization, sector or even a country to effectively move towards a sustainable transformation, sustainable supply chain management would eventually become one of the key enablers to bring a positive change in their entire ecosystem. ■

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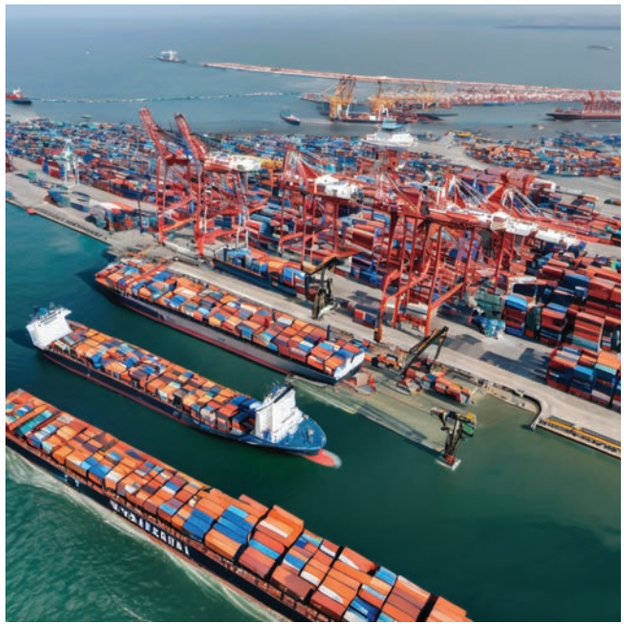
Sailing through Uncertainty: Adapting Supply Chains amidst the Red Sea Crisis

In the wake of the Red Sea crisis, global trade faces unprecedented disruptions, particularly impacting shipping routes from India to Europe and the United States. **Malcolm Dsouza-CCO- KSH Distriparks** explores the far-reaching consequences on supply chains, from challenges in export logistics to escalating costs, and examines strategies, including the increasing reliance on air freight, adopted by companies to navigate these tumultuous waters.

In recent times, the Red Sea crisis has emerged as a significant disruptor in the intricate web of global trade, particularly affecting the shipping routes from India to Europe and the United States. The challenges posed by this crisis have rippled through the supply chain, creating a domino effect on exports and imports alike. In addition to the Red Sea predicament, eastbound vessels navigating the Panama Canal are facing their own set of challenges, amplifying the turmoil in the shipping industry. In this article, let's delve into the impact of the Red Sea crisis on the supply chain and the strategies adopted by companies to mitigate its impact.

Challenges faced during export and import:

The Red Sea crisis has thrown a wrench into the well-oiled machinery of export logistics. Vessel schedules are changing daily, leading to capacity constraints as shipping lines are forced to cancel bookings. This constant flux has compelled exporters to expedite their shipment processes, causing a surge in rushed exports. The non-availability of scheduled vessels has also forced exporters to increase interim storage at Inland Container Depots (ICD) or manufacturing plants. This, in turn, has a direct impact on the overall export cost, with the specter of order cancellations looming large over exporters.



Furthermore, the uncertainty surrounding the Red Sea crisis has created an atmosphere of instability in the global market. Exporters are grappling with unpredictable shipping schedules, making long-term planning and commitment challenging. The financial strain on exporters is compounded by the need for increased storage facilities and the potential loss of customers due to delayed deliveries.

On the import front, the delay in vessel arrivals triggered by the Red Sea crisis has reverberated across the supply chain, leading to severe shortages of materials for Original Equipment Manufacturers (OEMs) and suppliers. In some cases, this scarcity has forced companies to implement temporary

shutdowns, disrupting production schedules and causing financial losses.

Global Rerouting and Escalating Costs:

The Red Sea crisis has prompted a global rerouting of cargo, with container ships circumventing the affected region by taking extended detours around the Cape of Good Hope in South Africa. While this strategy has helped in avoiding the immediate impact of the Red Sea crisis, it has come at a cost – both figuratively and literally. Freight rates have surged by up to 600%, reaching unprecedented levels. Recent weeks have seen ocean freight rates soaring, with some peaking at an astonishing US$10,000 per 40-foot container. This surge in costs has translated into an additional burden on exporters and importers alike.

The Cape of Good Hope detour alone has diverted over US$200 billion worth of cargo, emphasizing the colossal scale of the challenge faced by the shipping industry. This rerouting has not only increased transit times but has also added an extra layer of complexity to an already strained global supply chain.

Air Freight Dynamics Anticipating the disruptions caused by the Red Sea crisis and the subsequent escalation of ocean freight costs, there is a growing emphasis on air freight as a viable alternative. With air freight capable of reducing delivery times to a mere few days, as opposed to the weeks taken by ocean carriers, time has become a critical factor in supply chain management.

Air cargo, traditionally reserved for high-value and time-sensitive goods, is poised to play an expanded role in the supply chain ecosystem. As the demand for faster deliveries intensifies, air freight becomes a strategic choice for businesses seeking to mitigate the impact of the Red Sea crisis on their supply chains.

Way Forward and Strategic Considerations

The Red Sea crisis has cast a long shadow over the global supply chain, introducing unprecedented challenges for exporters and importers alike. The ripple effects of this crisis have been felt in rising freight costs, delayed shipments, and disruptions in production schedules. As stakeholders navigate these troubled waters, a reevaluation of supply chain strategies becomes imperative.

The adoption of air freight as an alternative to ocean carriers reflects the industry's resilience and adaptability in the face of adversity. However, the uncertainty surrounding the Red Sea crisis persists, and its continuing impact on global trade is a stark reminder of the interconnectedness of the modern supply chain. As businesses grapple with these challenges, a proactive and collaborative approach will be essential to weather the storm and emerge stronger on the other side.

Conclusion

Fluidized bed gasification process can be utilized to produce hydrogen, urea, methanol, ethanol, sulfuric acid through the gasification of Indian domestic coal blended with pet-coke. ■

Author

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Coal Gasification – A bright prospect for India towards energy security and net zero targets

Global warming is slowly becoming global burning so decarbonizing industries is no more an option but a necessity. Diverse options are being explored to decarbonize industries and many of those are already being implemented. CCUS (Carbon capture and utilization and storage), green hydrogen, CO2 to chemicals are various options being explored to implement as part of decarbonization and energy transitions requirements.

India is highly committed to achieve a state of net zero emission. India's economy is growing so energy requirements will keep on rising, and at the same time we are committed towards phasing out fossil fuel-based power generation. Energy security is the key for every growing economy. India is presently primarily dependent on coal and imports of oil and natural gas for its energy supply. Since the country is blessed with significant reserves of coal, phasing out fossil fuel-based power generation does not mean abandoning this huge quantity of coal. In this context, we need to give deep thought of utilizing our great asset coal meaningfully through greener pathways. Utilization of domestic coal for production of fuels & chemicals have real significance since it will help in reduction in fossil fuels import and would strengthen energy security of the country.

Challenges & Resolutions

Large quantity of fines and high ash content of Indian coal are crucial barriers for the success of coal gasification. One of Indian steel production plants had set up F.O.A.K (First of a Kind) coal gasification based direct reduced iron (DRI) and steel production plant; however, they faced problems in their fixed bed gasifiers due to 30-40% coal fines in the feed.

The above issues can be resolved by blending pet-coke with coal to bring the average ash content below 30% for making it favorable for fluidized bed gasifiers. Most of the pet-coke being produced from the refineries in India is being routed to cement kilns with potential environmental hazards as high Sulphur, metals in pet coke could eventually find way into the environment in absence of desulphurization facilities. Pet-coke blended with coal can be used as fuel in the utility power plants but the problem of SOx emissions remains an issue unless significant capacities of FGD (Flue Gas Desulphurization) plants are installed adding more cost to power production.

Co-gasification of coal, pet-coke and biomass could possibly be examined to introduce the green factor in production of hydrogen & other chemicals from coal.

Challenges in Coal gasification are:

- High ash content in Indian coal
- Large quantity of fines due to improper mining
- Lack of world class coal beneficiation facilities
- Variation in coal qualities due to absence of dedicated source mines

The above challenges play crucial role in the success of coal gasification, however, with Government's interventions by implementing necessary policies, these issues can be overcome within five years span.

Strategy

India has already announced a 100 MT gasification target by 2030. Gasification on a large scale through a consortium of companies would bring the success like the joint venture of various Indian government companies (Coal India Ltd., Gas Authority of India Ltd, RCF (Rashtriya Chemicals and Fertilizers Ltd) and Fertilizer Corporation of India Ltd.) is in the process to establish coal gasification plants to produce ammonia and urea at Talcher, Odisha.

Delayed coker would be a useful technology to be included in the refinery configuration that will lead to generation of pet coke that can be utilized as a blender to domestic coal for gasification. Considering 40% ash content in domestic coal, ~20% blending of pet-coke can bring down the overall ash content in 30~33% range suitable for fluidized bed gasification technologies.

Gasification facility has to be large enough for large scale production of urea (>3000 TPD) and Methanol (>5000 TPD) - Metric Ton per Day to suit economies of scale to justify the investment. The substantial savings in natural gas import to produce same amount of urea is an important benefit for this kind of project which gives energy security to the country and partial freedom from NG (Natural Gas) price volatility. The cost of urea produced through this route is expected to be cheaper than NG based urea, hence, reduction in fertilizer subsidies would further strengthen the project economics. Other by-products like ethanol, recovered sulfur (or sulfuric acid) will also contribute to the IRR (Internal Rate of Return) positively. With integrated carbon capture and utilization configuration, the CI (Carbon Intensity) of the produced urea & methanol will be lower which is needed to achieve net zero emission.

Gasification Technology

Gasification is a process that converts carbonaceous materials, such as coal, petroleum coke, biomass etc. into carbon monoxide and hydrogen rich gases (i.e., syn gases). Syngas derived from gasification processes contains a significant amount of CO & H2 to be utilized as per targeted final products.

Among the three types of the gasifier, the Entrained flow gasifier is a matured technology yet to be tested for high ash coal. Fixed bed gasification technology is also a developed technology but restricted up to coal having ~35% ash. Fluidized bed gasifier is suitable for high ash coal but not widely commercialized at this stage. Though, coal ash content is a crucial parameter, other properties such as cold and hot crushing strength, gasification reactivity & surface area, AFT (ASH FUSION TEMPERATURE), slag viscosity and behavior, ash composition, caking nature, petrographic characteristics, etc. are also vital towards selection of type of gasifier.

The major gasifier configurations are:

- Moving / Fixed Bed
- Fluidized Bed
- Entrained flow

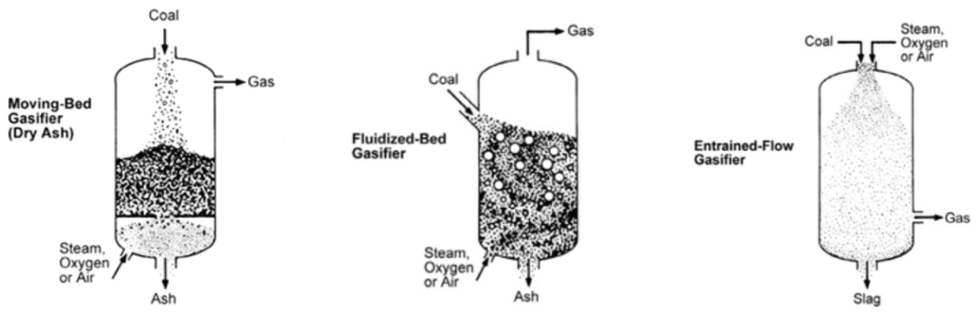
For the Fixed Bed, there could be co-current or counter-current flow of gas and carbon source. The main characteristics for the different configurations are summarized in table:

Parameters	Moving / Fixed Bed	Fluidized Bed	Entrained Flow
Carbon conversion	Low	Medium	High
Energy consumption	Low	High	Low
Heat & mass transfer	Poor	Good	Excellent
Feed particle size	50 mm (approx.)	Small (< 6 mm)	Fines (< 100 mesh)
Oxygen requirement	Low	Moderate	High
Operating conditions (pressure, temperature)	Low	Moderate	High

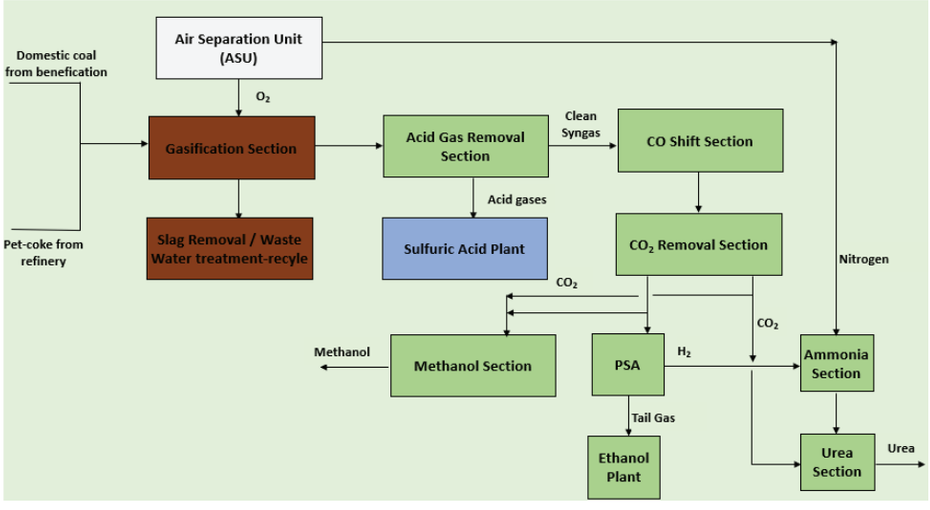
Both fluidized bed and entrained flow reactors can operate at higher temperature and pressure so suitable for gas turbines. Entrained flow gasifiers are flexible to manage variation in feed. The operating temperature is higher than the ash fusion point so that ash can flow easily out of the gasifier. Recent focus is towards power and chemical production from different types of solid fuels so entrained flow gasifiers are getting popularity.

Moving bed gasifier is suitable only for non-coking coals and can handle up to 35% ash, since it cannot handle pet-coke so this would not be best fit for Indian coal. Due to lower operating temperature a large amount of tar is produced in moving bed gasifiers. The reactor size is also larger than modern fluidized bed or entrained flow gasifiers. Most of the new gasifiers are based on fluidization, which could be circulating or entrained flow, or even high-speed transportation.

The different types of gasifiers have certain common features, such as: handling of slurry or dry powders, though the operating conditions like temperature, pressure, contact times differ widely; hence, the carbon



conversion efficiencies differ widely. Interestingly, the carbon conversion for low grade coals is higher in fluidized and entrained flow gasifiers because of their ability to operate at higher pressure and temperature, and ability to handle different types of feed including biomass. Chemical production from syngas requires higher pressure so these gasifiers are particularly suitable for that purpose. Most of the upcoming installations are based on oxygen firing entrained flow gasification.



Proposed Block Flow Diagram of Coal Gasification based co-production of Urea & Methanol complex

Considering the quality of Indian coals, fluidized bed gasifiers with high pressure operation are the best fit for immediate consideration; in the long term, we should also track the development of plasma gasifiers.

Process Description of co-production of Urea-Methanol from coal gasification:

Raw syngas produced from the gasifier contains various impurities so needs to be cleaned in the downstream syngas clean-up unit. Impurities are fine ash, char, slag, acid gases etc. Sulphur present in coal is eventually converted to H2S which is removed by downstream acid gas removal unit. Further, we also need to remove mercury and other impurities through various processes which are commercially proven technologies. Syngas contains high amount of CO & hydrogen, H2:CO ratio can be improved by water gas shift reaction to enhance hydrogen production as per downstream requirements. In this catalyzed reaction, steam and CO react to produce H2 and CO2. The CO2 produced in this reaction will be captured and utilized for urea as well as methanol production. Subsequently, AFT (Ash Fusion Temperature) the removal of acid gas components from the shifted syngas it mainly contains hydrogen with some impurities like CO, CO2, H2S/SO2 which can be removed through PSA (Pressure Swing Adsorption) as well as membrane technology and hydrogen to be used for ammonia production. Integration of CCU (Carbon capture and utilization) will enable production of blue hydrogen which still be cheaper than the green hydrogen in the current scenarios.

Conclusion

Fluidized bed gasification process can be utilized to produce hydrogen, urea, methanol, ethanol, sulfuric acid through the gasification of Indian domestic coal blended with pet-coke. ■

Author

Siddhartha Bandyopadhyay
Decarbonization Specialist
Bechtel India

Revitalize and Rejuvenate: Machines, the unsung Soul of engineering, deserves care too

In the face of intense global competition, onsite machining has become crucial for addressing eff iciency challenges promptly. Industries grappling with space constraints and downtime pressures require on-the-spot precision machining for prolonged machinery longevity. **Shiv Siddhant Narayan Kaul, Managing Director- NESL** draws concerns to both, local and global engineering practices, focusing on compliance, safety, and sustainability to tackle onsite machine challenges.

SHIV SIDDHANT NARAYAN KAUL
Managing Director
Nicco Engineering Services Ltd.

Onsite machining is a critical service for many industries. What specific machining challenges do you address, and how are these challenges over come?

Onsite machining serves as a critical solution for industries grappling with specific challenges. NESL's expertise addresses issues like inaccessibility, tight space precision, downtime reduction, large diameter machining, and safety concerns. Utilizing portable tools and skilled professionals, ensures efficient on-site machining for optimal equipment performance and longevity. The focus is to address challenges in various operations, such as boring, stud removal, facing, flange facing, alignment, milling, drilling, and tapping, offering a knowledgeable and effective approach along with solutions to industrial machining requirements.

How does NESL strategically align its services with both traditional Indian engineering practices and global industry?

Strategic alignment with both traditional Indian engineering practices and global industry standards requires a balanced approach that takes into account local preferences, global benchmarks, technological advancements, and a commitment to continuous improvement. The success of such alignment lies in our ability to bridge the gap between tradition and modernity, delivering solutions that resonate with diverse client concerning the following factors:

Adaptation to Local Practices: We synchronize our services with conventional Indian engineering practices by comprehending and honoring local methodologies, materials, and design standards. This adjustment guarantees that our company's products align with the preferences and needs of the Indian market. Our Leak Sealing compounds have been certified to meet the BIS standard, attesting to their quality. Additionally, our design team intricately creates bespoke clamps and enclosures specifically for the online leak sealing process, ensuring adherence to ASME Div1 standards.

Compliance with Global Standards: Our commitment to aligning with global industry practices is evident in our emphasis on compliance with international standards and certifications. By adhering to widely recognized engineering standards, our services consistently meet or exceed the expectations of clients operating internationally. As a testament to ethical business practices and risk reduction, we undergo audits to meet Sedex standards. This not only ensures transparency but also cultivates a positive brand image in today's socially conscious business environment.

Integration of Advanced Technologies: Nicco Engineering Services incorporates advanced technologies and modern engineering practices in response to evolving industry trends. This strategic adoption encompasses digital technologies, automation, and Industry 4.0 principles, enhancing overall efficiency, precision, and service quality.

Continuous Training and Skill Enhancement: Recognizing the dynamic nature of engineering, Nicco Engineering Services consistently invests in rigorous training programs. This commitment ensures the workforce remains updated on the latest engineering practices, fostering proficiency to meet the evolving demands of both traditional and global industries. Our emphasis on soft skills development aligns with a holistic approach to professional growth.

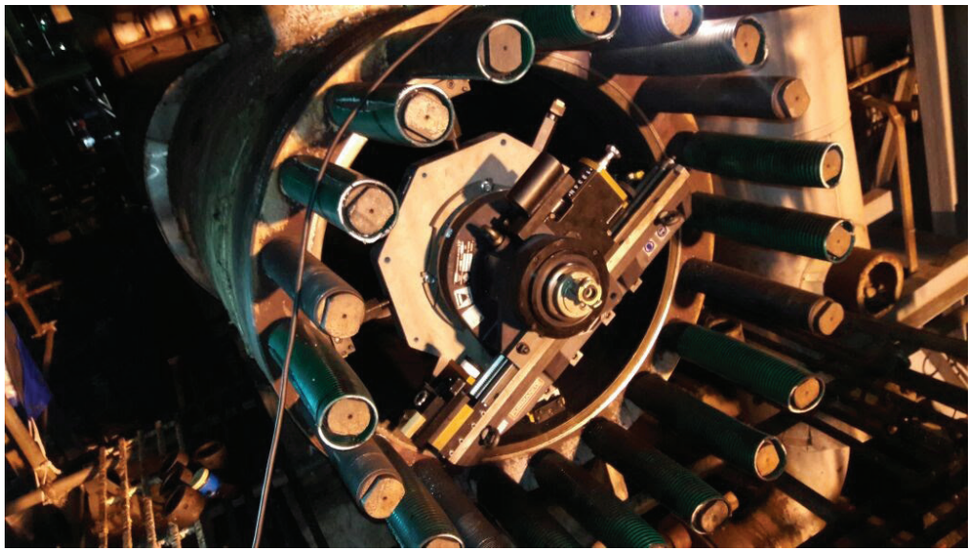
Tailored Solutions and Adaptability: In acknowledging the diverse needs in engineering, Nicco Engineering Services provides customized solutions aligned with both traditional and global preferences. This adaptability highlights the capacity to tailor services to the specific requirements of different markets, supported by a history of successful implementations.

Local Partnerships and Global Collaborations: Strategic collaborations with local entities in India provide valuable insights into traditional practices, market dynamics, and client expectations. Simultaneously, global collaborations enable access to expertise, technologies, and best practices worldwide, enriching our understanding and approach.

Sustainable and Eco-Friendly Practices: In alignment with global sustainability trends, Nicco Engineering Services actively integrates eco-friendly and sustainable practices into engineering solutions. This commitment responds to the increasing demand for environmentally conscious practices globally and aligns with traditional Indian values emphasizing sustainable development.

Client-Centric Approach: Nicco Engineering Services adopts a client-centric approach rooted in an understanding of the unique needs of each client, whether domestic or international. This approach is substantiated by a history of delivering tailored services that meet specific requirements, contributing to enduring client satisfaction and loyalty.

Service Availability and Responsiveness: The commitment to client service is underscored by the



readiness of technicians to provide assistance at client locations, even during non-standard hours. This proactive approach ensures that urgent issues, such as leakages at unconventional times, are promptly addressed, reflecting our dedication to client satisfaction through responsive

Are there emerging global trends that you foresee influencing the safety valve testing landscape in India and its relevance to Supply chain Management?

Here are some potential global trends that influences safety valve testing and its connection to Supply Chain Management, and it's worth exploring how these trends could apply to the Indian context:

Technological Advancements: The integration of Internet of Things (IoT) devices and sensors in safety valve systems has seen notable progress. Real-time data provided by these technologies enhances monitoring and testing procedures. This development contributes to predictive maintenance strategies, ultimately bolstering supply chain resilience by mitigating unexpected downtime.

Regulatory Changes: Ongoing alterations in global safety and environmental regulations hold implications for safety valve testing standards. Compliance with evolving international standards has become imperative for companies in the supply chain. This affects manufacturing processes and necessitates careful consideration in material and component sourcing.

Data Analytics and Predictive Maintenance: The adoption of data analytics and predictive maintenance tools in safety valve testing schedules has become a prevalent trend. This application optimizes testing processes, improving equipment reliability and minimizing disruptions in the supply chain. Cost-effective asset management is a key benefit.

Remote Monitoring and Testing: A global shift towards remote monitoring and testing solutions is influencing the inspection and testing of safety valves. This has implications for supply chain management by reducing the need for physical on-site presence, potentially resulting in time and cost savings.

Environmental, Social, and Governance (ESG) Considerations: Increasing emphasis on ESG factors is shaping sustainable practices in safety equipment management. This influence extends to the selection of testing methods, materials, and suppliers in the supply chain. The pursuit of certifications like EcoVadis reflects a global recognition of the importance of sustainability and NESL are heading for it.

Supply Chain Resilience and Risk Mitigation: The COVID-19 pandemic underscored the critical role of resilient supply chains. Effective testing of safety valves contributes significantly to overall supply chain resilience. By minimizing the risk of equipment failures, these measures help prevent disruptions in operations.

Global Collaboration and Standards: Collaborative efforts among countries and international organizations to establish and harmonize safety standards are influencing global safety valve testing practices. Adherence to common standards simplifies supply chain management by providing consistency in requirements, fostering global cooperation in ensuring safety and reliability.

Focus on Energy Efficiency: The global push for sustainability and energy efficiency could lead to innovations in valve technologies and testing methods, with potential implications for the sourcing of energy-efficient components within the supply chain.

Regarding Belzona polymeric coating, what types of assets can be effectively restored using this technology, and how does it contribute to asset longevity?

Belzona polymeric coatings are versatile materials designed to protect, repair, and enhance the performance of a wide range of assets across various industries. The technology is commonly used for the restoration and protection of equipment in challenging environments. Here are some types of assets that can be effectively restored using Belzona polymeric coatings:

Pipelines and Piping Systems: Belzona coatings can be applied to pipelines and piping systems to protect against corrosion, erosion, and chemical attack. By creating a durable barrier, these coatings extend the life of pipes, reducing the need for frequent replacements and minimizing downtime.

Tanks and Vessels: Belzona coatings are utilized to protect the internal and external surfaces of tanks and vessels from corrosion and chemical damage. This not only prevents leaks and structural failures but also prolongs the lifespan of the equipment, ensuring long-term reliability.

Pumps and Compressors: Belzona coatings provide excellent protection for pump casings, impellers, and compressor components. By resisting wear, abrasion, and corrosion, these coatings contribute to the efficient operation of pumps and compressors, ultimately extending their operational life.

Heat Exchangers and Condensers: Belzona solutions can be applied to the surfaces of heat exchangers and condensers to combat corrosion, erosion, and fouling. This protective layer enhances heat transfer efficiency, reduces maintenance requirements, and extends the overall service life of the equipment.

Concrete Structures: Belzona coatings are effective for repairing and protecting concrete structures such as bridges, tanks, and platforms. They provide a durable, chemical-resistant surface that guards against environmental factors, preventing degradation and extending the lifespan of the structure.

Rotating Equipment: Components of rotating equipment, such as shafts, bearings, and journals, can benefit from Belzona coatings. These coatings offer excellent adhesion, abrasion resistance, and corrosion protection, contributing to reduced friction, increased reliability, and extended equipment life.

Valves and Flanges: Belzona coatings are applied to valves and flanges to protect against corrosion and wear. This safeguards the integrity of these critical components, preventing leaks and ensuring reliable performance over an extended period.

Marine Equipment: In the marine industry, Belzona coatings are used to protect ship hulls, propellers, and other components from corrosion and biofouling. This not only enhances fuel efficiency but also prolongs the life of marine assets.

How does your company stay abreast of industry standards and regulatory requirements when conducting safety valve testing and calibration?

NESL employs a comprehensive strategy that includes continuous monitoring, engagement with regulatory authorities, active participation in industry events, internal research and development, and ongoing staff training to stay abreast of industry standards and regulatory requirements when conducting safety valve testing and calibration. This proactive approach allows NESL to provide reliable and compliant services without the need for plant shutdowns or compromising on safety standards.

Finally, onsite machine engineering is imperative for prolonged machinery longevity, and hence a lot more has to go in it for smooth and productive functioning. ■

Agile Gas Infrastructure to Transport Hydrogen & Gas Mix

AKHIL MEHROTRA
MD & CEO
Pipeline Infrastructure Limited

Much of the talk today around hydrogen (H2) focuses on the need to upscale production to meet Net-zero targets and the vast demand that will be soon required, but a major factor to achieving this is how will we provide access of H2 to the end users. The most promising approach is using existing natural gas pipelines for transporting hydrogen. It is technically possible as studies suggest that about 20% hydrogen can be blended into natural gas for transportation via gas pipelines, without any major investments.

As the world moves towards Energy Transition, the possibility of repurposing existing fossil fuel infrastructure to distribute "clean" energy is attracting a lot of attention. Hydrogen being one of the prominent candidate as a clean energy source a lot of talk has been going on about upscaling it's production. However, after scaling up, we need to transport it to end users and this part has added challenges towards provisioning of H2 gas across end users due to inherent properties of H2 gas towards metals.

Transportation of hydrogen can be done through the following three ways depending on the distance, volume, and state (Liquid / gaseous) in which hydrogen need to be transported:

- Pipelines tend to be the cheapest way to move hydrogen over longer distances. Constructing pipelines usually requires volume and demand certainty to justify investment. Additionally, existing natural gas pipelines can be repurposed provided they meet the technical criteria to reduce the risk of embrittlement. Repurposing of existing pipelines also enables blending of hydrogen within the existing natural gas networks for end uses where blended hydrogen can accelerate demand creation.

- Trucks are used to transport hydrogen in smaller volumes, both in gaseous and liquid form, for local distribution and longer distances.

- Ships are beginning to be used for larger volume, longer distance transport, mainly moving liquid

hydrogen (LH2), LHOCs, and ammonia. Shipping of hydrogen is currently expensive due to added conversion costs (liquefaction or chemical conversion) in addition to the necessary structural design to reduce risk of embrittlement.

Transportation of hydrogen through gas pipelines will be a cost-effective method as compared to the other alternatives. Reducing the cost of transporting hydrogen is crucial to make it economically viable. Time is also a factor as building new infrastructure has a significant lead time and multiple greenfield project risks, which may delay the growth of hydrogen as a key energy vector. Natural Gas pipelines already exist in abundance and repurposing them with minor technical upgradation would be the quickest way. Speed is of the essence if countries are to meet their Paris Accord nationally determined contributions (NDCs) to reduce greenhouse gas (GHG) emissions.

To establish the H_2 economy, hydrogen producers need to be connected to the users, and an optimum transport solution is via the existing gas infrastructure. There are many global projects investigating this scenario, one of them being the European Hydrogen Backbone (EHB) which is a collaborative effort with an estimated total investment of $50-100 billion involving the major transmission operators across Europe which envisages expanding the network to appx. 39,700 Km of hydrogen pipelines by 2040. This will be achieved by adding 12,300 Km of new H_2 pipelines, with the remaining 27,400 Km (i.e., 69%) of the network being made up of repurposed natural gas pipelines. The requirement to design and repurpose pipelines for H_2 service is of global importance for the safe and efficient transportation of hydrogen from producers to users.

Gas infrastructure provides the backbone for the economy, as without this key energy infrastructure, cities, homes, and industry wouldn't be able to function. But how does this relate to H_2. The complex infrastructure required to move H_2 to end users requires many critical components. These components range from pipelines, compression stations and valves, through to metering stations and city gate stations that enable transportation of gas to the end user. In all of this, pipelines make up most of the infrastructure and are designed and operated under a series of codes to ensure safety and efficiency of delivery.

Blending of hydrogen in Natural Gas Pipeline network

Hydrogen blending process consists of injecting concentrations of hydrogen into existing natural gas pipelines whose purpose can be either economical (to foster hydrogen market) or environmental (to reduce the carbon intensity of the methane). The injection of hydrogen into the existing gas grid could provide a quick and affordable transitional solution to handle the lack of an immediately available dedicated hydrogen infrastructure. Moreover, the injection of hydrogen provides the option of having access to renewable and low-carbon energy, up to a certain level, for all gas consumers connected to the gas network.

Depending on the share of hydrogen to be injected, the gas network might need concrete retrofitting actions. The extent to which modifications are required depends on multiple aspects related to technical characteristics of the gas network. The retrofitting of the networks brings challenges that can be technically solved in an affordable way for hydrogen shares up to a certain limit. Few studies have revealed that at relatively low hydrogen concentrations (up to 10% H_2 in volume), the gas system may not require major investment or modifications, while higher shares of hydrogen concentration may require significant investment - depending on the topology of the gas grid, distance of transport, equipment in the gas system and acceptance of H_2 and natural gas mixtures by the end user.

Repurposing natural gas pipelines for hydrogen is 10-30% of the cost of building new pure hydrogen networks. Blending hydrogen with natural gas in existing infrastructure will facilitate the use of a cleaner gas by end consumers. The possibility of blending H_2 to the Natural Gas network also comes with huge opportunities and additional challenges. This would require a detailed understanding of blending threshold during normal and transient operations in to eliminate the potential material, integrity, and operational issues as well the pipeline design implications.

Pipeline Infrastructure Limited (PIL) has proactively undertaken a key initiative to be ready for future energy transition by assessing the blending of Hydrogen in pipeline. Strategic projects are in progress to evaluate possibility of hydrogen blending/ transportation or readiness of PIL pipeline. This is one of the first hydrogen blend related projects in the transmission space in India. PIL has partnered with DNV for assessing the technical impacts on gas pipelines of using hydrogen at different

blending ratios (5%, 10%, 15%, 50% and 100%) covering assessment of pipeline integrity, pipeline safety and network operations with blended hydrogen. PIL has also signed a Memorandum of Understanding (MoU) with GAIL (India) for cooperation and collaboration towards development and strengthening of the hydrogen-based ecosystem in India.

Key Challenges

- On the technical side, modifications in some parts of compressors as well as installation of new and more turbines or motors and more powerful compressors to deliver the three-times higher volume flow of hydrogen compared to natural gas will be required. This will totally depend on the admixture of hydrogen.

- Hydrogen and natural gas have slightly different densities. This is a key factor in pipeline management as fuels in transit must be pressurized to optimal levels that balance volume with commercial viability. The fuels are also different in calorific heating value as well as corrosive propensities (which matters for the longevity of pipelines).

Conclusion

Hydrogen is expected to play a critical role in the future energy transition and cost-effective transportation is a key driver to expand the footprint of hydrogen. To move H_2 over distances, users either must ship it, build new pipeline infrastructure, or repurpose existing gas networks. Every time hydrogen is converted between energy vectors along the chain from production, through transportation and on to storage and use, this would result in efficiency losses. The selection of H_2 transportation method and vector is multi-faceted and requires early evaluation to ensure the process is optimised. . ■

Smartglass Integration: A New Era of Connectivity

Embarking on a journey through the forefront of innovation in smart glass technology, where trends are set and challenges met head-on, **Miss Pavithra Ravindran – CMO (Product Specialist) - Biznustek Systems** highlights the, pushing boundaries in water management with their AKVAZEN® Zero Liquid Discharge (ZLD) System. Proximaze smart glasses illuminate current trends, providing insights into the intricate balance of technology and environmental challenges, shaping a sustainable future for waterr treatment.

The global water crisis intensifies the urgency for innovative solutions, and smart glass integration into Zero Liquid Discharge (ZLD) Systems is positioned as a catalyst for change. The first to introduce this technology is Biznustek Systems, a USA-based ZLD market leader, where Proximaze smart glasses were integration with their AKVAZEN® ZLD. The convergence of smart glasses with ZLD technologies opens new horizons, ushering in a wave of enhancements in monitoring, maintenance, and decision-making processes.

The Global Smart Glass Market

According to a report by Markets& Markets, the smart glasses market is projected to reach US$5.8 billion by 2025, underscoring the widespread adoption of this technology across various industries. The smart glasses market is anticipated to witness a compound annual growth rate (CAGR) of 27.2% from 2021 to 2026, as highlighted by a report from Research and Markets. This statistic reflects the accelerating pace at which industries are recognizing the transformative potential of smart glasses in optimizing operational workflows.

Smart glasses empower operators and decision-makers in ZLD processes with real-time data visualization and analysis. According to a study by Deloitte, incorporating augmented reality into industrial processes can increase worker efficiency by up to 34%. This efficiency gain is particularly crucial in ZLD, where precision and timeliness are paramount for achieving optimal results.

IoT-Enabled Excellence for Industry 4.0 Compatibility

Proximaze's proximity technology, seamlessly integrated into the AKVAZEN® system, introduces Industry 4.0 compatibility with wireless connectivity and advanced sensors. Providing real-time visibility into water treatment processes, Proximaze

empowers manufacturing plants and industries with precise monitoring capabilities, automatic corrective decisions, and continuous surveillance of critical parameters such as temperature, pressure, water levels, and concentration levels.

Smartglass Integration: A New Era of Connectivity

Operators can now enjoy real-time monitoring of machinery performance and statuses, ushering in a new era of smart and connected industrial water treatment processes. The smartglass technology provides users with an immersive view of the proximity world, enabling efficient monitoring, training, troubleshooting, and maintenance processes. This integration significantly reduces training time, allowing for hands-on instruction without the need for a teacher or a traditional classroom setting. Proximaze's mixed reality technology gives operators the flexibility to perform maintenance and other tasks with both hands free, liberating them from the constraints of traditional methods.

Augmented Reality: Reshaping Training and Maintenance

Proximaze's smartglass integration with AKVAZEN® introduces augmented reality, projecting essential information and images onto the smart glasses. . The integration reduces training time significantly, allowing for hands-on instruction without the need for a teacher or a traditional classroom setting. Proximaze's mixed reality technology allows operators to have both hands free, enabling them to perform maintenance and other tasks without the constraints of traditional methods.

QR Codes for Seamless Information Transfer

QR codes act as dynamic bridges, connecting various components of water treatment systems seamlessly. This connectivity is not just about linking physical entities; it's about establishing a digital thread that runs through the entire network. Each QR code encapsulates a wealth of information relevant to the specific location or item, creating a streamlined pathway for data exchange. In practical terms, when an operator scans a QR code within the augmented reality interface, a wealth of contextual information is instantly accessible. This could include maintenance schedules, performance metrics, historical data, and other crucial details specific to the equipment or location in question. This real-time access to comprehensive information eliminates the need for manual data retrieval, reducing downtime and enhancing overall operational efficiency.

Enhanced Maintenance Procedures

One notable application of QR codes is in the realm of maintenance. Operators equipped with smart glasses can scan QR codes on machinery, instantly overlaying relevant information onto their field of view. This augmented reality display provides step-by-step instructions, schematics, and real-time data, facilitating swift and accurate maintenance procedures. As a result, downtime is minimized, and maintenance tasks are executed with a higher level of precision.

Improving Information Transfer between Locations

In a water treatment plant with multiple locations and intricate systems, the seamless transfer of information is paramount. QR codes embedded in the augmented reality environment serve as virtual conduits, facilitating the swift exchange of

critical data between different areas. This not only ensures consistent and accurate communication but also contributes to a more synchronized and responsive operation.

Precision in Performance Monitoring

With Proximaze, the granularity of performance monitoring reaches unprecedented levels. The system leverages advanced sensors and wireless connectivity to continuously gather real-time data on various parameters, including temperature, pressure, water levels, and concentration levels. This depth of monitoring ensures that operators receive a holistic and up-to-the-minute view of the water treatment processes.

Insights for Informed Decision-Making

The real-time data stream generated by Proximaze serves as a dynamic information hub, supplying operators and decision-makers with a constant flow of insights. These insights extend beyond mere performance metrics; they encompass predictive analytics, anomaly detection, and trend analysis. Armed with this comprehensive information, decision-makers can assess the system's health, identify potential issues, and make informed decisions swiftly.

Optimizing Performance in Real Time

Proximaze's real-time monitoring isn't just about gathering data; it's about actively optimizing performance on the fly. The system's intelligence enables it to identify inefficiencies or deviations from optimal conditions promptly. In response, Proximaze can trigger automatic corrective actions, ensuring that the water treatment system operates at peak efficiency. This proactive approach minimizes downtime, reduces the likelihood of equipment failures, and ultimately contributes to the longevity of the entire system. ■

Author

Pavithra Ravindran
Chief Marketing Officer (CMO)
Biznustek Systems

Acoerela creates Water-soluble Lipophilic Dyes

Singapore-based startup Acoerela develops a platform of water-soluble lipophilic dyes, the world's first full Bilayer Spanning Lipophilic Dyes that overcomes the limitations of traditional dyes like poor solubility and aggregation. Its dyes come in various colors and find applications in labeling extracellular vesicles, bacteria, and mammalian cells.

For example, the startup's gram-selective dye distinguishes between gram-positive and gram-negative bacteria based on differences in cell wall structure. These membrane dyes also allow for long-term cell tracking, over multiple generations, without toxicity. Acoerela is currently developing dyes that emit in the near-infrared II window, to enable non-invasive tumor imaging over extended periods in living mice.

Thermochemical catalysis technology

Trillium Renewable Chemicals, a US-based startup, exemplifies the shift towards green manufacturing. The company specializes in manufacturing plant-based acrylonitrile from sustainable feedstocks, challenging the conventional use of petroleum-based raw materials that generate excessive heat and toxic byproducts such as cyanide. Trillium's patented thermochemical catalysis technology eliminates the need for biological processes, offering a cost-effective, health-conscious, and scalable alternative. Notably, this approach minimizes the transportation of hazardous products over long distances.

Lignolix develops Lignin Upcycling Technology

Lignolix is a US-based startup that upcycles lignin from plant waste into high-performance specialty chemicals. Since lignin is difficult to process due to its smell, the startup's technology breaks down lignin into small pieces while preserving its functional properties. This approach reduces odor and color challenges and is also compatible with other products. The end products are applicable in cosmetics, adhesives, flavorings, and fragrances and the Lignolix technology is easily scalable.

Creative use of Phosphate Waste by SusPhos

SusPhos is a startup from Denmark that applies smart chemistry to upgrade phosphate-rich waste. The startup generates waste-free alternatives to products derived from fossils. SusPhos's patented technologies provide sustainable phosphate products such as high-quality flame retardants and specialty fertilizers.

Volatile analyzes Flavors using an Electronic Nose

Using AI and smart sensors, UK-based startup Volatile identifies flavors. The startup integrates analysis of flavor drivers, chemical composition screeners, and electronic nose devices. Its electronic nose, Scout2, is a metal-oxide gas sensor that detects odors and volatile organic gases. Moreover, Scout2 features a modular design compatible with other major sensor manufacturers. This device controls air quality and also monitors the ingredients of solids and liquids and operates irrespective of changing environmental conditions.

MantiSpectra develops a Chip Spectral Sensor

Mantispecta develops Near-Infrared (NIR) spectral sensors based on the Indium Phosphide platform. These sensors identify and quantify materials' chemical information encoded at wavelengths. The computation is also completed in a fast, contactless, and non-invasive manner. Usually, traditional spectrometers are expensive and complex to use. Yet, Mantispectra's portable mini sensors solve these challenges by fitting neatly into various devices.

Computational Genomics

Israeli startup agPlenus delivers predictive technology to discover novel chemicals for crop protection. The startup's target-based technology uses a virtual screening approach to rapidly compute the analysis of lots of molecular data. agPlenus incorporates genomics, AI, and big data to extend the chemicals library, as well as increase the probability of successful chemical product development.

Fastone offers a Multi-Cloud Computing Platform

Fastone is a Chinese startup that develops cloud-based solutions for automotive, life sciences, and smart manufacturing. Based on the server less and Application Defined Cloud (ADC) framework, Fastone builds a cheap, fast, and scalable computing platform. It is used for drug discovery and electronic design automation. The startup's online computer-aided engineering simulation platform further allows HPC modeling on any device. It runs finite element analysis (FEA), computational fluid dynamics (CFD), and thermal analysis. Further, Fastone offers cloud platforms for bioinformatics and exploratory data analysis.

A new weigh station for batching ingredients

New batch-weighing system is designed for accurate batching direct to blenders or mixers. The station features a P100 batch-weigh receiver combined with a KT20 loss-in-weight twin-screw feeder, mounted on a collection hopper. The batch-weigh receiver combines a vacuum receiver with a reliable weighing

Coperion K-Tron

system for batching of major ingredients. The resulting combination allows ingredients to be conveyed and weighed so that accurate batching of ingredients can take place on either a cumulative or sequential basis. The KT20 loss-in-weight twin-screw feeder can accurately add smaller amounts of high-value minor ingredients to the batch. Batch-weigh receivers are available in sizes from 30 to 1,000 L.

Nextmol builds a Cloud-based Chemicals Design Lab

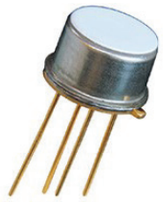
Nextmol is a Spanish cloud-based molecular modeling startup that utilizes AI to design new chemicals. The startup incorporates atomic-scale models and computational chemistry. It characterizes molecules, simulates hard-to-reach experiment conditions, and predicts the most promising molecules. Additionally, Nextmol identifies the causes of lab failures. To achieve fast and reliable results, the startup also offers high-performance cloud computing.

Switch amplifiers for intrinsically safe applications

The new KFU8-SR-EX* is a universal powered switch amplifier that can be used in intrinsically safe applications and functional safety installations up to safety integrity level (SIL)2. The new KFU8 device can be supplied with 19 to 30 V d.c. or 90 to 253 V a.c. With this functionality, a single device can be used with various supply voltages. As a result, fewer components need to be kept in stock and in the field technician's toolbox. The switch amplifiers transmit discrete signals from NAMUR sensors or mechanical contacts in the hazardous area to the safe area. A proximity sensor or switch controls the load on the control side via a changeover relay contact. All modules feature line fault detection. In the event of a fault, the relays de-energize and the fault is indicated by LEDs.

Humidity sensor designed for industrial drying

The HYT 939P temperature and humidity sensor is equipped with a PTFE filter, which makes it well-suited for industrial drying applications. The sensor's compact housing allows for easy positioning within



the monitored process, while the filter minimizes the influence of particulate matter and volatile organic compounds on the humidity sensor. The sensor is based on a capacitive-polymer measurement principle with a fast response time, low drift and hysteresis. The sensor remains stable in a high-humidity environment and can sustain condensation conditions. It comes fully calibrated and temperature-compensated.

Pipeless Flowmeters with Field - Configurable Design

Dwyer Instruments

The new Series PI is a variable-area flowmeter that utilizes a spring-loaded piston. The fluid flow in the application causes this piston to move along the axis of a precision-tapered shaft, creating a variable orifice in direct proportion to the flowrate. The piston is mechanically linked to a readout pointer and actuates switches or a transmitter. Straight pipe runs are not required before or after the meter, allowing for installation in areas with minimal space. The three-wire version of the Series PI is equipped with a solid-state relay that can be configured in the field for alarm output.

World's first 5G smartphone for hazardous areas

The IS540.1 is said to be the world's first 5G smartphone

for ATEX and IECEx zone 1/21. The intrinsically safe mobile device, which was also developed for use in 5G campus networks, offers extensive deployment scenarios ranging from predictive maintenance, augmented reality (AR) applications, control and cooperation of production robots and production lines, management of automated guided vehicles (AGVs), autonomous transport robots, remote monitoring and support to PTT video calls in the system area to prevent plant failures. The high-performance Qualcomm QCM6490 chipset, a large 6-in. display, 48-MP main camera, and standards such as Wi-Fi 6, Bluetooth 5.2 and NFC complete the Android 12 smartphone's extensive feature package. ■

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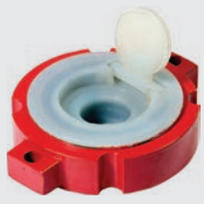
SWING CHECK VALVE


PLUG VALVE


BUTTERFLY VALVE


BALL CHECK VALVE


BALL VALVE


DIAPHRAGM VALVE

LINED PIPES


SPOOL PIPE


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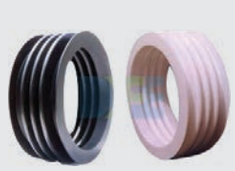
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