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Refining & Petrochemicals

SPECIAL FEATURE

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Vivek Agrawal Country Manager, Petrofac

Co-Author - Sanjay Garg Assistant General Manager, Petrofac

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Driving the world

ONGC inks Heads of Agreement with ExxonMobil for Deepwater exploration in Indian East and West coasts

New Delhi, India: Oil and Natural Gas Corporation (ONGC) has signed a Heads of Agreement (HoA) with ExxonMobil for Deepwater exploration in East and West coasts of India. The HoA document was signed in the Ministry of Petroleum & Natural Gas on 17 August 2022 by Shri Rajesh Kumar Srivastava, Director (Exploration), ONGC and Dr. Monte K Dobson, CEO & Lead Country Manager, ExxonMobil India in the presence of Shri Pankaj Jain, Secretary, Ministry of Petroleum & Natural Gas.

HoA being exchanged between Mr. Rajesh Kumar Srivastava and Dr. Monte K Dobson in the presence of Shri Pankaj Jain, Secretary, Ministry of Petroleum & Natural Gas will focus on the Krishna Godavari and Cauvery Basins in the eastern offshore and the Kutch-Mumbai region in the western offshore.

At the event, The Petroleum Secretary Shri Pankaj Jain said, "Partnerships between a National Oil Company (NOC) like ONGC and an International Oil Company (IOC) like ExxonMobil will bring tangible benefits in the entire energy value chain and open new vistas to Exploration & Production paradigm. This collaboration will boost our confidence in going further ahead in deep-water exploration in the east coast of India where the potential is quite significant."

Shri Rajesh Kumar Srivastava said, "With this strategic collaboration to pursue exploration, I look forward to long lasting partnership. Through the discovery route, ONGC hopes to move to development wherein the inherent strength of ExxonMobil would be beneficial for efficient fast-track monetization. This will enable ONGC to ensure steps towards Energy Security for India."

Government has announced a National Hydrogen Mission (NHM) in 2021, to develop Hydrogen as a fuel for transportation

New Delhi, India: Government has announced a National Hydrogen Mission (NHM) in 2021, which inter alia includes development of Hydrogen as a fuel for transportation. Various Research and Development (R&D) activities on Hydrogen are undertaken by Oil and Gas PSUs (OGPSUs). Further, OGPSUs have formed a Hydrogen Corpus Fund to fund R&D on various facts of Hydrogen including its application as an automotive fuel. Few R&D projects have also been undertaken by OGPSUs use green hydrogen for fuel cellbased mobility.

Government has supported projects involving Research, Development & Technology Demonstration. Some of these projects are Hydrogen fuel based two wheelers, developed and demonstrated by Banaras Hindu University whereas Hydrogen fuel based three wheelers have been developed and demonstrated by Banaras Hindu University, IIT Delhi and Mahindra & Mahindra. Indian Oil Corporation Limited (IOCL) patented Hydrogen Spiked Compressed Natural Gas (H-CNG) technology has been demonstrated at Rajghat Bus depot on 50 BS-IV compliant commercial CNG buses as part of joint study with M/s Indraprastha Gas Limited.

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Major interventions by Government of India to generate electricity from Renewable Energy sources

New Delhi, India: According to the study carried out by Central Electricity Authority, Ministry of Power with an objective to project the Optimal Generation Capacity mix for 2029-30, the estimated electricity generation from renewable energy sources was assessed to be 39% of the total electricity generation.

Government have taken several steps to promote renewable energy in the country to achieve the goal of 500 GW of non-fossil fuel capacity by 2030, in line with Hon'ble Prime Minister's announcement at COP-26. These include: Permitting Foreign Direct Investment (FDI) up to 100 percent under the automatic

route, Waiver of Inter State Transmission System (ISTS) charges for inter-state sale of solar and wind power for projects to be commissioned by 30th June 2025, Declaration of trajectory for Renewable Purchase Obligation (RPO) up to the year 2030, Setting up of Ultra Mega Renewable Energy Parks to provide land and transmission to RE developers on a plug and play basis, Schemes such as Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan, Solar Rooftop Phase II, 12000 MW CPSU Scheme Phase II, etc, Laying of new transmission lines and creating new sub-station capacity under the Green Energy Corridor Scheme for evacuation of renewable power, Setting up of Project Development Cell for attracting and facilitating investments, Standard Bidding Guidelines for tariff based competitive bidding process for procurement of Power from Grid Connected Solar PV and Wind Projects. Government has

issued orders that power shall be dispatched against Letter of Credit (LC) or advance payment to ensure timely payment by distribution licensees to RE generators.

Coal India to set up Nine Coking Coal Washeries of 30 Million Ton Capacity



New Delhi, India: India needs aggressive focus on increasing coking coal production to reduce import dependence. Union Minister of Coal, Mines and Parliamentary Affairs, Shri. Pralhad Joshi said this while inviting suggestions from all stakeholders for finding technology solution and using available coking coal in the country.

Shri. Joshi was addressing a workshop on "Coking Coal Strategy for Indian Steel Sector" moving towards an Atmanirbhar Bharat, organised by the Ministry of Coal, the Coal India Limited (CIL), and the Confederation of Indian Industry here. Speaking on the occasion, the minister stated that there has been increase in import of coking coal in the last few years although domestic coking coal production also increased to 51.7 million ton.

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NEWS

L&T commissions Green Hydrogen Plant at its manufacturing complex in Hazira, Surat, India

to 1.6 MW peak DC, will be part of future expansion.

Commenting on the occasion, Mr.



Subramanian Sarma, Whole-time Director & Sr. EVP (Energy), L&T said "L&T is at the forefront of providing innovative and sustainable solutions that will help meet the energy needs of the future. We are proud that our engineers have set up the Green Hydrogen generation plant at Hazira complex and

Mumbai, India: Larsen & Toubro (L&T) announced the commissioning of a Green Hydrogen Plant at its AM Naik Heavy Engineering Complex in Hazira, Gujarat. The plant was inaugurated by Mr. Shrikant Madhav Vaidya, Chairman – Indian Oil Corporation Limited. The production of Green Hydrogen based on an alkaline electrolysis process has begun. The plant will produce 45 Kg of Green Hydrogen daily, which will be used for captive consumption in the company's Hazira manufacturing complex.

The Green Hydrogen Plant is designed for an electrolyser capacity of 800 kW comprising both Alkaline (380 kW) and PEM (420 kW) technologies and will be powered by a rooftop solar plant of 990kW peak DC capacity and a 500kWh Battery Energy Storage System (BESS). As part of the first phase of the project 380 kW Alkaline electrolyser has been installed, while the 420 kW PEM electrolyser along with solar plant capacity augmentation integrated it with the existing manufacturing shops for use of the green hydrogen."

Aramco announces record second quarter and half-year 2022 results

Dhahran, Saudi Arabia: The Saudi Arabian Oil Company "Aramco" announced its financial results for the second quarter of 2022, posting a 90% year-on-year (YoY) increase in net income and declaring a dividend of \$18.8 billion to be paid in the third quarter. Aramco aims to maintain a sustainable and progressive dividend in line with future prospects and underlying financial results.

The results set a new quarterly earnings record for the Company since its Initial Public Offering in 2019, and were primarily driven by higher crude oil prices and volumes sold, and higher refining margins. Commenting on the results, Aramco President & CEO Amin H. Nasser, said "Our record second-quarter results reflect increasing demand for our products — particularly as a low-cost producer with one of the lowest upstream carbon intensities in the industry."

Return on average capital employed (ROACE) for the second quarter and half year ended in June was 31.3%, compared to 16.7% for the same periods in 2021, reflecting stronger crude oil prices and volumes sold and improved downstream margins. Capital expenditure increased by 25% to \$9.4 billion in the second quarter and by 8% to \$16.9 billion for the first half of 2022, compared to the same periods in 2021. Aramco continues to invest to capture growth opportunities, progressing the strategic integration of its upstream and downstream segments, expanding its chemicals business, and developing prospects in low-carbon businesses.

Archroma to Acquire the Textile Effects Business Of Huntsman Corporation Pratteln, Switzerland:

Pratteln, Switzerland: Archroma, a global leader in sustainable specialty chemicals and solutions, announced it has entered into a definitive agreement to acquire the Textile Effects business ("Textile Effects") from Huntsman Corporation. Since its formation in 2013, through a series of mergers & acquisitions, as well as internal investments in R&D, manufacturing and service capabilities, Archroma has been building a comprehensive portfolio of solutions to serve the emerging needs of the textile industry. The combination with Textile Effects and its rich historical roots of Huntsman and Ciba Specialties will create a technology powerhouse that will include Archroma's legacy heritages of Sandoz, Hoechst, Clariant, BASF and Dohmen who have been at the cutting edge of the textile industry for decades, and together will continue to serve customers for years to come.

Tata Chemicals Limited Consolidated Income from Operations for the quarter ended June 2022 stood at ₹ 3,995 Cr (532 million USD) up by 34%

Mumbai, India: Tata Chemicals Limited declared its financial results for the quarter ended June 30, 2022. The Company reported income from operations for the quarter on consolidated basis at ₹ 3,995 Cr (532 million USD), up by 34% as compared to ₹ 2,978 Cr (397 million USD) of the corresponding quarter of last year. The operating performance reflects improved realizations, efficient cost management and optimum capacity utilization in challenging market conditions, and in the context of rising input and energy costs.

Commenting on the results, Mr. R. Mukundan, Managing Director & CEO, Tata Chemicals Ltd., said, "The global demand environment continues to be positive across our products and their applications. While this positive momentum is expected to continue in the near to medium term, the input side environment especially energy remain at elevated levels coupled with logistic challenges that continue

NEWS

to be seen in the market. The team has shown agility and has responded well by staying close to customers and supply chain partners. We continue our long-term focus on excellence by leveraging digitalization and sustainability. In addition to operational excellence, we continue to focus on executing growth capex."

Green Hydrogen & Green Ammonia, Metal & Metal Downstream, and Infrastructure are among the ten industrial projects approved by the HLCA committee of the Government of Odisha

Bhubaneswar, India: The 29th meeting of the High-Level Clearance Authority (HLCA) held under the chairmanship of the Hon'ble, Chief Minister of Odisha, Shri Naveen Patanaik approved 10 industrial projects worth INR 74,620.18 crores (9.9 billion USD) that would generate employment opportunities for over 24,047 people in the State.

The committee approved the proposal of ReNew EFuels Private Limited (REFPL) to set up Green Hydrogen (Capacity: 20 KTPA) & Green Ammonia Plant (Capacity: 100 KTPA) in Paradip, Jagatsinghpur district, against investment of INR 2000 crore (267 million USD). The establishment of these plants will have a pragmatic environmental impact since they will create ammonia and hydrogen using renewable resources, which will cater to the demand of steel and fertiliser sector in Odisha.

The committee gave approval for setting up of 60,000 MT Industrial Structure and 6,000 MT Steel plant equipment facilities to Tata Steel

Limited (Growth Shop) against an investment of INR 1000 crore. This would give a significant boost to the Government of Odisha's "Vision 2030: Development of Downstream Units in Metal Sector," which offers short, medium, and long-term interventions to accelerate the business ecosystem for metal sector downstream units. The HLCA gave a nod to Adani Enterprises Limited to set up a 4.0 MTPA Alumina Refinery and 175 MW CPP Plant in Kashipur, Rayagada district, against an investment of INR 41653 crore.

In addition, the panel gave nod to set up 2.5 MTPA steel plant and 370 MW CPP in Kalinga Nagar, Jajpur district, by Orissa Alloy Steel Pvt Ltd against an investment of INR 8000 crores. Sompuri Infrastructures Private Limited got the approval to set up a 24 MTPA Pellet plant & 6 MTPA of Filter Cake at Dhamra, in Bhadrak district, at an investment of INR 7811 crore, a 30 MTPA Beneficiation plant at Deojhar, in Keonjhar district and a 30 MTPA Slurry Pipeline connecting its proposed 30 MTPA Beneficiation plant at Deojhar, in Keonjhar district to the proposed Pellet plant at Dhamra, in Bhadrak district against investments of INR 4592.18 crore and INR 3674 crore.

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NEWS

Huntsman Announces Agreement to Sell Textile Effects Division



Peter Huntsman, Chairman, President, and CEO

Texas, United States: Huntsman Corporation announced it has entered into a definitive agreement to sell its Textile Effects division to Archroma, a portfolio company of SK Capital Partners. The total enterprise value of the transaction is approximately \$718 million, which includes the assumption of approximately \$125 million in net underfunded pension liabilities as of December 31, 2021. The acquisition is being partially funded with preferred equity, of which Huntsman is taking up to \$80 million, an amount SK Capital Partners will seek to syndicate prior to the transaction closing.

Over the last twelve months ending June 30, 2022, the Textile Effects division reported sales of \$772 million and adjusted EBITDA of \$94 million. Huntsman anticipates cash taxes on the transaction of approximately \$50 million. Huntsman intends to report Textile Effects as discontinued operations beginning in the third quarter of 2022. The transaction is subject to regulatory approvals and other customary closing conditions and is expected to close in the first half of 2023.

Peter Huntsman, Chairman, President, and CEO commented: "Over the past seven months, we have conducted a comprehensive strategic review of our Textile Effects division, including detailed discussions with a wide range of relevant parties. After evaluating several different options and thoroughly reviewing prospective offers for the business, our Board of Directors decided that SK Capital would be a better owner of the business over the long-term than Huntsman and that the value they offered was in the best interests of our shareholders.

Alleima

Alleima - Advancing Industries through Materials Technology



Alleima Tube Mill

A

t the end of August 2022, following shareholder approval of a proposal presented by the Sandvik AB board of directors, Sandvik

Materials Technology officially separated from Sandvik AB. On 31 August 2022, Sandvik Materials Technology rebranded to Alleima and became listed on the Nasdaq Stockholm Exchange as a standalone company.

For 160 years, Alleima has been moving materials forward, turning raw into precision, and advancing industries worldwide. The advanced stainless steels and special alloys of Alleima are worldleading. Fuelled by a desire to care,

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Alleima Steel Mills

deliver, and evolve, Alleima provides leading materials solutions, advances customer operations, and enables new technologies. Utilizing its position as a technology leader, progressive customer partner, and sustainability driver, Alleima aims to become an even stronger and independent company within the materials industry, with a clear direction for the journey ahead.

Forged from the past, engineered for the future

The Alleima history dates back to 1862 when Sandvik was founded by Göran Fredrik Göransson. For 160 years, Alleima has been a global engineering and materials technology company synonymous with absolute industry premium, offering products and services that enhance customer productivity, profitability, and sustainability.

The new name of Alleima combines two

core strengths of the business – alloys and materials – with alei, an old version of the word alloy, as the foundation.

Göran Björkman, President of Alleima, said: "In Alleima we have found a name that encapsulates the core of what we do and our uniqueness in a great way. It will enable us to position ourselves as the technology leader, progressive customer partner, and sustainability driver that we are."

Same old - brand new

Although a new name and brand, Alleima will continue to be the same supplier, with the same values, way of working, expertise and the same high-quality stainless steel and alloys offering. All existing orders and contracts remain valid and confirmed delivery schedules will not be affected. The company's capabilities, global offering, and footprint continue to be the same. Control over the supply chain from

SPECIAL FEATURE



Alleima Tube Mills

research and development (R&D) to melt to the final product remains the priority of Alleima. Sandviken in Sweden is still the main industrial site, R&D location, and the company's head office. Employees in its global locations continue to support customers across different time zones.

22 Advancing together

In India, one of the key growth areas is specialty chemicals, which make up a large share of the total chemicals and petrochemicals market of the country. In addition, the demand is estimated to have risen at a high pace during the last couple of years. This, added to the high corrosion challenges they place on manufacturing equipment, means there is a need for advanced materials to drive more efficient, profitable, and sustainable processes, products, and applications.

The Mehsana production facility in Gujarat, India, began life as an extrusion unit for tubes, pipes, and hollow bars.

In 2004, a cold pilgering line was added, and a limited number of grades were produced. Over the years, Alleima also extensively upgraded the finishing facilities for the production of heat exchanger tubing. More recently, in response to the elevated demand for special alloy tubes in India and the Asia Pacific,



Alleima Facility



Alleima Extrusion



Steam generator tubes

Alleima expanded its product portfolio to accommodate an enhanced cold pilgering process, pushing ahead with a much greater variety and quantity of tubes.

Steam generator tubes

As a result, various processes for producing tube products, including hot extrusion and cold pilgering, also known as hot and cold extrusion, now occur on-site. Additionally, the Mehsana production also manufactures grades used in the specialty chemicals market, such as alloy 200, alloy 201, alloy 600, alloy 625, alloy 825, C 276, C 22, and many other special grades to meet corrosion resistance challenges.

These advanced alloys are demanded by customers who depend on reliability, particularly in oil and gas and chemical facilities where operating environments can be highly corrosive and production is integrated, meaning the performance of every component is critical.

These unique grade tubes are manufactured to stringent Alleima quality standards and offered highly competitive delivery options. For example, Alleima can deliver tubes from 12.7 mm to 50.88 mm from its Mehsana mill without limitations on quantity.

Beyond heat exchangers, the advanced corrosion-resistant tube, pipe, and hollows available from Alleima can propel process equipment across various industries, including petrochemical, oil and gas, chemical, and fertilizer.

In the oil and gas sector, Alleima has been a world-leading manufacturer of subsea umbilical tubing for over 25 years. It has supplied 122 million meters (400 million feet) of umbilical tubing with zero failures and 99% on-time delivery. That's enough tubing to circle the world three times! The Mehsana production unit has supplied mother hollows for half of this quantity since 2004.

Separately, with special alloys from the Sanicro[®] family available from Mehsana, Alleima supplies customers across the region with tubes and piping to withstand the most corrosive environments.

Learn more about the company's journey to Alleima here



The Alleima zero defects policy and full traceability from melt to final finished tube also give customers the confidence of complete control over their products, empowering them to install or modify the material with full knowledge of its history.

Everything is new, nothing has changed

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

Read more at <u>alleima.com</u> ■

Chemtech India Day Seminar 2022 India: A Preferred Investment Destination



(L to R) : Pramod Khosla, Yatinder Pal Singh Suri, Richard Clemens, Maulik Jasubhai, Mirik Gogri, Andreas Foster, Dr Andreas Widl, Hemant Shetty



in Frankfurt. More than 200 industry professionals from chemical processing industries attended the seminar organized in partnership with DECHEMA & VDMA.

In his welcome address, Maulik Jasubhai, Chairman & Chief Executive, Jasubhai Group & Chemtech Foundation informed, "With the next edition of Chemtech World Expo in 2024, we will complete our half century of our contributions to the Indian chemical and process industries." As envisaged by the Honourable Prime

Minister Narendra Modi, India is poised to become a fully developed country by 2047 and will play a critical and pivotal role in finding solutions for the chemical process industries that will counter the challenges of climate and environment. Taking cognizance of India's ambitious target to achieve carbon neutrality by 2070, he said, "This will require greater cooperation, greater engagement and greater innovation. We would like to propose that we expand our cooperation with DECHEMA and ACHEMA wherein India's emerging scientists, chemists and engineers can have an opportunity to be Research Assistants and Industry Internships. If DECHEMA can facilitate

this exchange, in identifying projects and companies are willing to provide this Assistantship and Internships, we at Chemtech Foundation will provide scholarships/assistance to the tune of €25,000/per year to cover the costs for these students. I hope we can together build in this idea and engage in this most important aspect of developing future intellectual and business leaders between our two countries."

Over the last few decades the Indian business as well as industrial landscape has undergone major transformations and in context with the changing geopolitical and geo economic scenario world is looking at India as preferred alternate destination to China. Keynote

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alternate destination to China. Keynote Speaker, Mirik Gogri, Head of Corporate Strategy, Aarti Industries Ltd and noted partnerships as the most preferred way of entry in Indian chemical market where the local partner provide support from R&D to manufacturing. He said, "The local partner provides critical support in various local clearances including regulatory and statutory clearances required to set up plant and start the manufacturing in India". Pramod Khosla, Chairman & Managing Director, Khosla Profil Pvt Ltd shared insights into the emerging opportunities in Indian market and emphasized on increasing demand for high end filtration & separation solutions. Dr Andreas Widl, Chief Executive Officer, Chairman of the **Executive Board SAMSON AG talked** about applications of Digital Twins for the process Industry and using drones to mitigate risk in maintenance of assets.

Chemtech and DECHEMA have been partners for almost 5 decades and along with VDMA have enabled the processing industries from Germany & India to build great partnerships. Since 1979, Chemtech India Day Seminars have been the most sought after co-located event during each edition ACHEMA to highlight the capabilities & project trends in the Indian process industry, Promote Technology transfer, Joint ventures & international Cooperation and most importantly Promote India as an Investment Destination especially for the chemical processing & allied industries. Dr Andreas Förster, Executive Director, DECHEMA; Richard Clemens, Managing Director, Trade Associations for Food & Packaging machines, Process Engineering Machines & Apparatus, VDMA welcomed the guests to the seminar. Yatinder Pal Singh Suri, Executive Director, Chemtech Foundation appraised the attendees on the emerging business scenario in India and upcoming edition of Chemtech's tradeshows for energy scheduled in March 2023 and 31st edition of Chemtech World Expo scheduled in March 2024.

Abhijit Dani, Vice President, Praj Industries and Pankaj Sahay, Business Development Head – EU, Jindal Stainless presented mementos to the dignitaries. Samson AG, Larsen & Toubro, Jindal Steel & Power Ltd, Jindal Stainless, Praj Industries and Maruti Valves were support partners for Chemtech India day Seminar 2022. Seminar was followed by networking evening after the Vote of Thanks by Hemant Shetty, CEO, Chemtech Foundation & Jasubhai Media Pvt Ltd.

New Energy Projects and the Role of EPC Contractors



Vivek Agrawal Country Manager Petrofac

Co-Author

Sanjay Garg Assistant General Manager Petrofac

n view of the Paris agreement in 2015, temperature rise needs be limited to below 2°C. The world must reach net zero

emissions globally by the middle of the century to limit the temperature rise. India is the fourth largest emitter after China, USA and the EU. Currently, India imports 85% of its crude oil demand and spends over US\$160 billion of foreign exchange every year for energy imports – this is likely to double in the next 15 years. The rise in crude oil price directly increases the import bill. Geopolitical uncertainties in the world require India to reduce its dependency on imports. Alongside the net zero target, the Indian government has set out a series of goals, including obtaining half of its energy from renewables and reducing the carbon intensity of the economy by 45%, both by 2030. Most countries have pledged to achieve net zero by 2050, China by 2060, Russia by 2060. Bhutan has already achieved net zero.

To attain energy independence and to honour the Paris agreement goal, the Government of India (GOI) has come up with several policy announcements which incentivize owners to set up green energy projects. For example: The Indian government's green hydrogen and ammonia policy is aimed at boosting the domestic production of green hydrogen to 5 million tonnes by 2030, making India an export hub for the clean fuel. The Ministry of Power has also indicated that energy plants set up to produce green hydrogen/ ammonia would be given connectivity to the grid on a priority basis. Initiatives such as: Net Carbon Zero emissions by 2070; Coal Gasification 100 MMT by 2030; 50% of India Power generated through renewable energy by 2030; increase in non-fossil energy to 500GW by year 2030 and a reduction in Carbon Emissions by 1 ton, by 2030 are aimed at reducing dependence on imported fossil fuel and reduced carbon emission leading to energy independence for India i.e. "Atmanirbhar Bharat" (self-reliant India).

If all above targets are to be met, it will require huge investment (~ US\$250 billion) during the next six to eight years. Many owners, licensors, research institutes and vendors have made plans for developing new energy projects. During the last couple of decades, many companies, including power producers have commissioned large scale renewable energy projects (wind, solar and hydro) in India. This has created a solid foundation for green energy projects. In fact, we at Petrofac are committed to becoming a net zero company by 2030 or sooner - and even as we work to decarbonise our own business, we are helping other organisations and industries around the world to do the same. At Petrofac, our

expertise and experience in designing, building, and operating complex energy infrastructure is vital to the new energy sector. Our ongoing contribution to policy development and regulatory frameworks is also recognised and valued by governments and key stakeholders around the world.

Let's do a little bit of environment scanning since the technologies are still at the stage of emergence. The industry is collectively working to find solutions to the issues such as scalability, transport, storage and logistics, maintenance, lack of skilled resources, no past track record, supply chain challenges, risk-reward sharing model and many other challenges leading to the sustainable commercial operation of green energy projects.

While deciding the Engineering, Procurement, and Construction (EPC) execution models for such green energy projects, the following points may be helpful:

- Past Track Record should not be an issue as most of the participants are on a learning curve. Bid qualification criteria could be rationalized to include the EPC contractors who have delivered projects in the oil and gas sector during last 20 years or so.
- Value based companies should be encouraged to participate in such projects. This will help create a healthier ecosystem of progressive

contractors. This could be facilitated by the Government – by appointing a nodal agency for identifying and encouraging serious players, thus creating a supportive and transparent environment to conduct business.

- Industry leaders may think of working towards purposeful collaboration with EPC contractors. Creating a community of cross-sector peers, will be hugely beneficial in increasing preparedness and efficiency for the sector. Ideally, initiatives should be structured so they do not lead into a monopoly for any component in the value chain.
- EPC contractors need rely-upon Front End Engineering Design (FEED).
 Developing meaningful FEED for projects is a challenge. There could be scenario that the same EPC contractor does the FEED and then execute the project after completion of FEED.
- Creating and maintaining a complete and up-to-date approved vendor list is critical to any project. Having a list specific to green energy projects should, or can be, jointly created by the owner and the FEED contractor.
- Issues around lack of standards guidelines, procedures, and statutory requirements could be a deterrent to a project. End user, consultants, licensor, Government bodies, EPC contractors and suppliers can collaborate to

develop standards, procedures to bring synergy and uniformity across the industry in India, leading to minimum acceptable standards.

- More statutory bodies like the Oil Industry Safety Directorate (OISD) to enforce standards and provide clearance, with an aim to maintain continuous follow-up on compliance.
- While the rise of green hydrogen will create countless new job opportunities, many individuals still lack the necessary training and skills to support the hydrogen economy. As the industry matures, a shortage of specialized workers will hinder its progress. Industry and Technical Educational Institutes may come together to develop training courses for the purpose.
- Green hydrogen is also incredibly challenging and expensive to store and transport. It is a highly flammable gas with a low volumetric density, requiring investment in specialized pipelines and carriers. A possible solution is conversion into NH3 and procure state subsidy.
- Adapting digital initiatives would help in mitigating the risk and striking the right balance between Capital Expenditure (CAPEX), RISK and Operational Expenditure (OPEX).

Digital technology is one of the critical levers for accelerating the transition to green hydrogen – especially Artificial Intelligence of Things (AIoT) – a combination of artificial intelligence and internet of things technology, that enables the optimization and automation of systems through enhanced data management and analytics.

 EPC contractors bear the maximum pressure because of unrealistic cost and schedule requirements. We collectively as an industry need to find a solution to this.

The complexity and uncertainty of mega projects cannot be overstated.
 EPC contractors take on risk for the delivery of a project at a fixed price, to a fixed schedule and with milestone payments (effectively funding the supply chain). There is a lot of risk' and uncertainty to price into the project – a lot can go wrong. Therefore, compensation to EPC contractors could be a combination of reimbursable converted to lump-sum after a certain stage.



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Maintaining Business Agility & Adopting Digital Transformations



Reep Hazarika Managing Director, BCPL

Reep Hazarika, Managing Director of the Brahmaputra Cracker and Polymer Limited (BCPL) in conversation with Chemical Engineering World, shared the latest developments of the company, comprehensive future investment plans for net zero goal, digital transition and much more.

What are the latest developments in your company?

BCPL is setting up two new projects i.e. Butene-1 plant and HPG (2nd stage) plant at Dibrugarh, Assam at a cost of Rs. 386.75 crore. The Butene-1 plant shall be a 10 KPTA plant producing Butene-1 using ethylene. The plant will provide a consistent supply of Butene-1, which is a monomer feedstock of the plant, reducing dependence on external sources. The HPG (2nd stage) plant shall be a 52 KTPA plant. Second stage of hydrogenation of HPG will yield more value added products suitable for gasoline pool. Presently, site enabling jobs have been completed and 31

piling jobs are being awarded for both the projects. Construction activities are progressing as per schedule. The project is expected to be commissioned in July, 2024.

Apart from the above, after six years of successful operation, BCPL is now planning for capacity expansion and diversification. We are in continuous discussion with the Licensors for debottlenecking of the plant and also exploring the possibility to expand our business as well as edging our way into new business segments for a sustainable future and revenue growth.

BCPL has signed an MoU with Inland Waterways Authority of India (IWAI), Ministry of Ports, Shipping & Waterways, Govt. of India, for streamlining the logistic chain movement to BCPL Plant in Dibrugarh via the National Waterway-2. This MoU with IWAI is expected to facilitate economic development and seamless transportation of cargo and aid in export of finished products to ASEAN countries via the waterways. BCPL has signed an MoU with M/s Syama Prasad Mookerjee Port, Kolkata for setting up of a logistic chain for movement of cargo for Petrochemical Complex of BCPL at Dibrugarh from Haldia Dock Complex. The scope of the MoU is to explore possibilities for providing space for setting up tankages for storage of imported feed stock, raw materials etc. within the jurisdiction of the port and will branch out setting up a

"In order to become selfsustainable and increase profitability, the capacity needs to be nearly doubled. We are anticipating more Natural gas production under the Government of India flagship program Hydrocarbon Vision 2030 for Northeast. BCPL has envisaged more value added products with the coming up of the National Gas Grid in Northeast India."

streamlined logistic chain for movement of feedstock, raw materials etc. required for the BCPL plant in Dibrugarh.

Further, with the projection of exploration of additional gas from nearby upstream companies, BCPL is in the process of carrying out de-bottlenecking study of all the major units of the plant including Duliajan and Lakwa.

Share about your future investments and aligning with Net Zero goals.

BCPL has several ambitious futuristic investment plans to align with net zero goal. One of the most prominent investment plan is carbon dioxide recovery from the exhaust stack of amine column of C2+ recovery unit. BCPL and Oil India Ltd.

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has been working in this ambitious project and are hopeful of attaining fruitful results in near time to come.

We are also planning to introduce solar power and substitute it for nonrenewable source of electricity on noncritical areas like residential Township. Additionally, BCPL will put on hands to convert all its public transport vehicles to electric vehicles in the near future. In order to prepare a comprehensive future investment plan for net zero goal, BCPL is in the process of hiring expertise for providing the implementation road map of such an exercise as also handholding for the successful execution.

What are were some major challenges in your company and how have you addressed them?

. BCPL is a small plant having a capacity of only 2,80,000 TPA polymers. In order to become self-sustainable and increase profitability, the capacity needs to be nearly doubled. We are anticipating more Natural gas production under the Government of India flagship program Hydrocarbon Vision 2030 for Northeast. BCPL has envisaged more value added products with the coming up of the National Gas Grid in Northeast India. BCPL is in discussion with major Oil producers, both PSUs and private companies, to know the expected quantity and quality of available gas that will help future expansion of BCPL.

As mentioned above, BCPL have inked MoUs with M/s SMPK and IWAI for setting up of imported feed terminal at Haldia Dock Complex and to set up a logistic movement of feed through waterways using NW-2. If economically viable, feed naphtha may be imported from ASEAN countries via Haldia terminal to achieve this ambitious goal of capacity expansion.

What is your way forward for optimising a digital transition?

BPCL had started and adopted digital transformations since the very start of the business operations. The digital transformation journey at BCPL was a greenfield project with a holistic design of its business processes which enables the sourcing of raw materials and services to sales of its finished products. BCPL's digital transformation portfolio consists of ERP solutions, mailing solutions and state of art IT infrastructure, E-initiatives applications for paperless offices, adoption of collaboration platform for online meetings/webinars, Biometric attendance system and so on, which are hosted on its on-premise data centre facilities. However, these IT systems and infrastructure are witnessing technological obsolescence over the period of time due to rapid developments in the Information Technology domain.

To keep pace with and maintain business agility, few new initiatives are being taken for the way forward of digital INTERVIEW

transition / transformations: Manual pass system for contractual workers to be replaced with RFID based digital pass system, Digitization of the official records with e-document Management System, Digitization of Board meetings with implementation of paperless Board meeting system, Implementation of SAP based Plant maintenance and Production planning modules, and Work Permit Management (WPM) system, etc.

As part of this continued journey, BCPL is exploring and evaluating the adoption of hybrid, that is on-premises as well as cloud, models of IT systems, architectures and services at BCPL



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Energy As a Service

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hange is surging through the energy sector. A shift to a new Energy-as-a-Service (EaaS) business model

is transforming the market, benefitting customers and boosting the deployment of low-carbon technologies. The energy production sector is one of the most affected by digital transformation. Electricity is what connects us today and will make us travel tomorrow. In the fight against climate change, it is therefore important to ensure that the steady increase in electricity consumption is matched by a greater share of production from renewable sources.

Energy as a Service is an innovative business model in which the company not only provides electricity but also related services: from consultancy to system installation, from monitoring software to consumption control software. As the transition to a CO2-free system is driving companies, organizations, public administrations and consumers to look for new ways to use and manage their electricity consumption, an energy service provider monetizes the value created by the digitization of the energy sector. The Energy-as-a-Service approach shifts from asset-focused, centralized power generation and the sale of it to passive consumers. Instead, it offers end-to-end management of a customer's energy assets and services.

Preamble

Energy as a Service is a new paradigm moving towards a decentralized, digitized and electrified energy system. Smart technologies make it possible to integrate different sources of supply and to modify consumption autonomously in real-time. The needs of the consumer, industrial and commercial segments are changing. The ways in which energy is supplied are changing with the integration and automation of systems. In short, the digital transformation of the energy sector is a particularly complex process, but one with undoubted advantages in terms of both cost reduction and environmental sustainability.

Energy as a Service opportunity, therefore, encourage renters to activate solutions that reduce costs through more efficient consumption. These models enhance energy generation through renewable 36

sources without significant investment by end consumers. In the future, consumers and businesses will not just pay their bills for heating and lighting their homes and facilities. The growing need to reduce the reliance on fossil fuels and decrease the carbon footprint could also propel the energy as a service market, in the upcoming years. A rapid rate of urbanization could play a key role in fueling the growth in the energy as a service market in future.

Solar and wind energy continue to be a prime choice for investment. More than 37% of the total investment within the renewable energy sector in 2016 was directed toward solar and wind energy projects across the globe, according to the FS-UNEP estimate; these wind energies accounted for 47% of the total investment in 2016. Global Wind Energy Council (GWEC) estimates that the total installed capacity of wind energy across the globe is likely to reach 792GW by 2020 increasing from 497GW in 2016, adding an average of 72GW per annum.

EAAS Innovations

Three main factors are contributing to

Key Contribution of EaaS Models to Power Sector Transformation



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the development of EaaS: technological advances in electricity generation; improved energy storage capacity; the spread of smart devices and smart city development.

Research into renewables is lowering the cost of installing climate-neutral systems. Photovoltaic, wind and marine energy sources are becoming reliable sources and their share of energy is gaining in importance. The combination of large batteries allows energy to be stored during periods of lower demand and released during peak demand.

The internet of things and cloud computing are some of the innovations

that make it possible to integrate renewable and traditional energy, collect and measure large amounts of data and automate complicated supply processes. In addition to technological development and the increased focus on sustainability in the fight against climate change, the development of EaaS is also driven by the pandemic, which has dramatically increased the cost of energy production.

EAAS involves a pool of highlysynchronized smart assets that are interconnected to provide a service/s. In an EAAS platform, a digital layer is employed that coordinates and distributes both energy and information in realtime. This allows the EAAS partner of a



Revenue Streams for Energy- As- Service Models

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August 2022

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How an Energy-As-A-Service Contract Works

consumer to enhance energy efficiency by enabling the trade of interactive products and services.

Advantages of EaaS

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Energy as a Service is a new paradigm moving towards a decentralized, digitized and electrified energy system. Smart technologies make it possible to integrate different sources of supply and to modify consumption autonomously in real-time. The needs of the consumer, industrial and commercial segments are changing. The ways in which energy is supplied are changing with the integration and automation of systems. In short, the digital transformation of the energy sector is a particularly complex process, but one with undoubted advantages in terms of both cost reduction and environmental sustainability.

One of the most interesting new features of Energy as a Service is the arrival in the energy sector (which has historically posed high barriers to entry) of new players able to provide a wide range of innovative services. The integrated approach of the EaaS model can provide greater support to customers who want to install renewable energy or storage systems. For example, several solutions are emerging for those who do not want to install technologies in their homes (such as renting photovoltaic panels) that allow customers to keep their contracts even when they move to a new address.

Energy as a Service opportunity, therefore, encourage renters to activate solutions that reduce costs through more efficient consumption. These models enhance energy generation through renewable sources without significant investment by end consumers. The role of electricity and its suppliers will change dramatically in the coming period, with new companies entering the market to provide new types of services.

Digitalization of the power sector is encouraging energy-related services. Energy experts can study energy consumption data to decide what kind of services should be offered for reducing electricity bills. They can also decide the pool of distributed renewable generation technologies that can be used to supply power to a consumer who is ready to shift to self-consumption.

EAAS is unlocking the benefits attached to the adoption of renewable energy sources. It can also control the demand side of the power sector. The use of data analysis and automation will allow optimization of power consumption with targeted load shedding. The effective utilization of the EAAS concept, however, demands intensive digitalization. Consumers will have to switch to smart electric devices that allow sharing realtime power consumption data. The use of real-time information and data analysis enable automation and other energyrelated services. An EAAS platform will need the trust of distribution system operators that transfer energy from the source of generation to the end consumer. Traditionally, the distribution system operators respond to changing power demand, by reinforcing the power infrastructure. However, with EAAS platforms wasteful expenditure can be avoided if the conventional practice of network reinforcement is substituted by meeting peak demand through stored energy.

While the power sector is on verge of a transformation, EAAS is a necessary concept that is enabling consumers to embrace pocket-friendly, and environmentally-appropriate power consumption practices.



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Circular Approaches and Decarbonization Pathways for a Sustainable Future



40 Chief Sustainability and Communications
Officer, Nouryon



Eduardo Nardinelli Senior Vice President, South America & Global Carbon Business Leader, Nouryon

Vivi Hollertt, Chief Sustainability and Communications Officer and *Eduardo Nardinelli,* Senior Vice President, South America & Global Carbon Business Leader at Nouryon, have shared the company's recent innovative solutions, sustainable business strategies and products while ongoing a path towards clean energy.

How is Nouryon responding to the new world order to address the urgency to address climate change?

At Nouryon, we are addressing climate change head-on and it's a major focus of our sustainability strategy. Our 'Commitment to a Sustainable Future' is based on long-term thinking and achieving growth through continuously improving our safety and environmental performance, growing and innovating to create sustainable solutions that enable our customers be more sustainable, and engaging and partnering with our employees, customers, suppliers, and society to drive sustainable progress.

Nouryon has set ambitious 2030 targets, which include reducing operational greenhouse gas emissions (GHG) for Scopes 1 & 2 by 40%, reducing water consumption intensity by 10%, and reducing total waste intensity by 10%, versus a 2019 base year. By 2050, we aspire to be a net zero organization. We are making progress on these targets. Most recently, we announced five carbon neutral sites (Scopes 1 & 2) that we operate at customer facilities in Brazil. This achievement is made possible given the circular approach of our Integrated Manufacturing Model in our Renewable Fibers business.

Chemicals play an integral role in society, and many of the products that Nouryon offers contribute to helping mitigate climate change. For example, our Polymer Specialties products are used for lightweight composite parts in windmills for renewable electricity, solutions for solar panels with long durability and high efficiency, and insulation for highquality, high-voltage cables. Our Expancel® expandable microspheres are used to make customers' end products lighter and obtain different surface effects, which helps reduce environmental impacts by requiring less raw materials and reducing weight. One example of a recent innovation is Expancel® HP92 microspheres, which is breaking boundaries for thermoplastic microsphere fillers in high-pressure manufacturing processes for the automotive industry.

"Lightweight materials are in high demand from automotive manufacturers to meet increasingly strict emission regulations and strong consumer interest in fuelefficient vehicles that do not compromise performance or passenger comfort."

Lightweight materials are in high demand from automotive manufacturers to meet increasingly strict emission regulations and strong consumer interest in fuelefficient vehicles that do not compromise performance or passenger comfort.

What are the opportunities for your organization in the near foreseeable future and key focus areas for business.

Society is demanding that companies become more sustainable in the way they produce products. Similarly, our customers need more sustainable solutions for their everyday products to help them reach more consumers while reducing their impact on the planet.

For Nouryon, sustainability is integrated throughout our business strategy. Chemistry plays a vital role in helping to mitigate climate change. As a global specialty chemicals company, our essential solutions are in everyday products, including personal care (such INTERVIEW

as toothpaste, sunscreen, and shampoo), cleaning goods (like detergents and phosphate-free dishwasher tablets), paints and coatings, agriculture and food, pharmaceuticals, and building products. By incorporating sustainability in everything we do, we benefit our planet, our business, and our customers - ensuring that we continue to grow and thrive in the years ahead. In 2021, we launched several new products with sustainability benefits and increased sales of our sustainable solutions that meet our customers' needs. In fact, 38% of our 2021 revenue came from Eco-Premium Solutions, which is how we describe our products when they offer significant sustainability benefits over mainstream alternatives in the market while providing the same or better functionality. Additionally, 71% of our research and development pipeline was focused on solutions with a sustainability benefit. We continue to develop innovative solutions that help our customers be more sustainable and meet the demands of consumers. By continuously improving our operations, and continuing to invest in more sustainable solutions, we will continue to grow our business. This also helps us attract the right talent and build stronger relationships in the communities in which we operate.

What are some of Nouryon's initiatives and planned investments, in short & long term to achieve carbon neutrality.

We are making good progress on our decarbonization strategy. In support of the objectives of the UN Paris Agreement, we have already significantly reduced our emissions over the last decade.

Our carbon business strategy includes both short and long-term initiatives. Some examples include improving efficiency in our operations and optimizing our fuel mix in addition to increasing our use of renewable energy through power purchase agreements, on-site renewables, utility programs and certificates. We are also currently analyzing indirect GHG emissions from activities across our value chain. Furthermore, we continually explore collaboration opportunities with our customers and suppliers and evaluate and deploy new, innovative technologies such as those in the ICOS Capital Fund III, where we are a strategic investor. We are also integrating net zero and climate change considerations into our strategy and planning.

How are you preparing the organization for future sustainable growth?

We are continuing to execute our growth strategy, while focusing on our 'Commitment to a Sustainable Future'. We aim to grow our leading position in specialty chemicals by exceeding customer expectations with innovative and sustainable solutions that address societal needs – today and in the future. We achieve this by focusing on attractive and growing end-markets. Our end-markets are resilient, sizable, and include Home & Personal Care, Agriculture & Food, Paints & Coatings, Natural Resources, Polymer Specialties, and Renewable Fibers. They are driven by societal megatrends and these trends influence our customers, among them, increasing demand for ecofriendly and more-natural, bio-based products, renewable energy and raw materials, biodegradable solutions, and recycling improvements.

As mentioned, we continually invest in innovation for more sustainable solutions to provide our customers in these growing end-markets. We also invest in innovation regionally to serve our customers' needs.

For example, in India we expanded our office and research center in Mumbai to support our regional growth plans in Asia. The innovation center in Mumbai also provides product testing and application support tailored to local needs, with specific focuses on the Agriculture, Home and Personal Care, and Paints and Coatings end-markets. We also opened an Innovation Center, along with a new, eco-friendly office in Dubai, United Arab Emirates. In the Americas, we opened our Agricultural Application Development Center in Itupeva, Brazil and an Innovation Center in Bridgewater, New Jersey in the United States.

In 2021 and 2022, we introduced several new products, including LumaTreat®, a

patented smart-tagged polymer line of products that is revolutionary in the water management industry. And Thioplast® EPS 35, an innovative solution that enables high-performance coatings and adhesives to withstand harsh environments in the construction, automotive, aerospace, marine, and energy industries.

We continue to expand production capacity across all regions to meet increasing customer demand. Our recent expansion projects include a new facility in Southeast Asia to produce our Bermocoll® solution to meet global demand in the Paints & Coatings end-market; increasing our Expancel[®] microspheres and polymer production in China; doubling our Dissolvine® green chelates capacity in the Netherlands; and expanding production capacity at our Levasil[®] colloidal silica manufacturing facility in Green Bay, Wisconsin, US, to meet growing demand from the Construction and Packaging endmarkets.

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Strategies for Future Hybrid Energy Storage Projects

he economics of solar-plusstorage systems in energy production continue to improve around the world.

Even still, there are some lesser-known hardware and software strategies that can be deployed to significantly increase revenues.

As the collocation of energy storage with renewable energy becomes universal, power producers are looking for creative ways to harness greater efficiency and sell into new energy markets to increase the value of their assets.

Pairing solar with energy storage becomes a global standard

According to a new report by Clean Horizon, an energy storage consultancy, there are more renewables-plus-storage projects than standalone energy storage systems across the globe. Renewablesplus-storage projects account for the majority of storage capacity in emerging markets including Africa, Australia and South America. In the United States, the largest market for energy storage worldwide, 58% of deployed storage capacity is collocated with solar. In fact, most of the large-scale energy storage systems expected to come online in the U.S. over the next three years will be collocated with solar. Europe is the exception to this trend - 85% of energy storage projects are standalone, due to project economics and restrictions around collocated battery use for ancillary services.

By itself, solar is non-dispatchable, requires ramp up and ramp down generation elsewhere on the grid, and needs flexible resources to fill in intermittency and variability of power output. But when paired with solar, energy storage guarantees that reliable renewable power is readily available, complemented with balancing engines to ensure the system is optimised.

The cost of energy generation from a solar-plus-storage facility has been declining rapidly around the world in recent years. On average, the cost has dropped from over 350 USD per megawatt-hour (MWh) in 2015 to less than 60 USD per MWh for projects expected to be commissioned beyond 2022. Plus, improvements in photovoltaic (PV) panel efficiency and availability of larger panels have significantly increased the power and energy density of utility-scale solar plants



System efficiency starts with design

About 99% of all solar-plus-storage facilities globally are AC-coupled, where the battery system and PV plant are connected to separate inverters in parallel. But by reducing the number of AC/ DC conversions in a solar-plus-storage system, power producers can reduce inefficiencies and improve revenues.

With DC-coupled solar-plus-storage systems, solar generation flows directly to the battery, via a cost-efficient DC/ DC converter, and avoids conversion losses from an inverter. As a result, DCcoupled systems are 3% more efficient than AC-coupled systems. Plus, the DC/ DC converter that creates compatibility between the PV panels and the battery is less expensive than purchasing a second inverter needed for AC-coupled systems. This translates to both lower capital expenditure and installation costs.

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However, there are some applications where AC-coupling remains the most cost-effective strategy. For example, ACcoupling is more appropriate for large solar plants collocated with small energy storage systems because the energy being stored will be highly impacted by efficiency losses. Additionally, if the same battery is going to be used by other generation sources, DC-coupling would increase efficiency losses due to the impact of power flows at the AC/ DC conversion stage. Power producers should also be aware that DC-coupled systems typically do not satisfy contractual obligations in some regions requiring a clear demarcation between the metering of solar panels and the battery.

DC-coupling is especially useful for making energy shifting, one of the most popular use cases of solar-plus-storage projects, more profitable. DC-coupling allows power producers to avoid production curtailment by storing power that would otherwise be "clipped" in the battery. To maximise plant productivity, the amount of PV panels deployed is always higher than the rating of the AC/ DC inverters. When maximum power is reached on AC-coupled systems, the surplus of the production energy over the inverter threshold is lost. But with DCcoupled systems, the "clipped" energy can easily be stored in the battery.

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By storing solar energy directly in the battery, project owners can generate additional revenue by selling power to the grid at night by discharging the battery. Applications like energy shifting, in which the batteries are charged and discharged frequently, benefit the most from the minimal efficiency losses that DCcoupling provides, compared to a direct consumption application. The trend toward DC-coupled systems pairs well with a growing preference within the industry for prefabricated modular battery enclosures. Modular energy storage systems are highly optimised for DC-coupled systems since the battery can be connected to the inverters that are distributed across the entire PV field rather inexpensively, compared to standard 40-ft containers.

Demand for modular systems is growing for both DC- and AC-coupled systems, and for good reason - modular battery design can significantly reduce labour and equipment costs. With prefabricated modular systems, batteries are loaded into modules at the manufacturing facility. Unlike container-based solutions, where equipment is installed in the field.

Greater complexity means demand for smart controls

Greater system efficiencies translate into greater energy yield. As new energy markets emerge, those yields can become new sources of revenue. However, the future of solar-plus-storage is more than just hardware; software optimisation is a critical next step to ensure utility-scale storage systems coupled with renewables are fully optimised.

Smart energy management systems can support a variety of applications to maximise the value of the energy produced by the power plant. Leveraging weather, use-case, historical system performance and battery data, energy management software can forecast how much power an adjoining plant will produce and take advantage of and balance for price variations, among other insights.

The ability to manage complexity is of the utmost importance when new system designs are implemented. DC-coupled systems are inherently more complex and require additional, although less expensive, components than AC-coupled systems. Software is needed to orchestrate the operation of both the PV inverter and DC/DC converter and ensure compatibility to provide the desired outcome for the plant operator.

Wärtsilä recently commissioned a 40 MW / 80 MWh solar-plus-storage facility in Georgia, USA, which serves as a great example of this co-optimisation between hardware and software. The DC-coupled design increases energy delivery during peak demand times and enables RWE Renewables to sell nearly 200 MW of solar generation onto the grid. The facility, however, takes project optimisation a step further. Wärtsilä's sophisticated GEMS Digital Energy Platform controls the entire hybrid plant while its new cloud-based IntelliBidder software automatically bids firm energy into the day-ahead markets. IntelliBidder leverages machine learning and optimisation algorithms based on automated and forecasted data and real-time trading for elevated valuebased asset management and portfolio optimisation.

Due to the increased penetration of clean power and trends in mass electrification, including the anticipated surge in electric vehicles, it's critical for energy and solution providers to continue to innovate to meet demand while ensuring grid reliability and affordable power prices. There is significant opportunity for power producers to save resources by implementing optimisation strategies, and ultimately benefit the bottom line. DC-coupling, modular design, and energy management software are key optimisation strategies we are confident will continue to generate meaningful returns for power producers.



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BPCL to infuse Rs 1.4 lakh Cr on Petrochem, Gas Business

Bharat Petroleum Corporation (BPCL) will make an investment of Rs 1.4 lakh crore in petrochemicals, city gas and clean energy in the next five years. The company has firmed up plans to diversify and expand in adjacent and alternative businesses to create additional revenue streams and provide a hedge against any possible future decline in liquid fossilfuel business.

Six strategic areas have been identified as pillars of future growth and sustainability. These are petrochemicals,

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gas, renewables, new businesses (consumer retailing), e-mobility and upstream, while the core businesses of refining and marketing of petroleum products continue to serve as a solid foundation, providing stability and consistent cash flows. It has laid out a detailed roadmap under each of these strategic areas, and has planned a capex outlay of around Rs 1.4 lakh crore for the next five years. It will set up petchem projects at its oil refineries at Bina and Kochi. The company has identified two new refinery-integrated petrochemical projects - 1.2 million tpa ethylene cracker unit at Bina refinery and 0.4 million tonne polypropylene unit at Kochi refinery.

L&T Construction awarded contract for its Heavy Civil Infrastructure Business



The Construction arm of L&T has secured a significant order from Nuclear Power Corporation of India Limited (NPCIL) for its Heavy Civil Infrastructure (HCI) Business to build natural draught cooling towers and a cooling water pump house for the Rawatbhata atomic power project -7 &8.

The scope involves constructing natural draught cooling towers, cooling water pump houses, erection and commissioning of cooling water pumps, and large diameter cement mortar lined and coated steel pipe (CMLC), the main medium to transport hot water from the turbine to the cooling towers.The project is scheduled to be completed in 36 months.

Niharika Projects' residential complex work to begin in 2023

Niharika Projects intends to develop a residential complex in Ranga Reddy district of Telangana.

The project will spread over 2.24 acre of land parcel and will see development of two blocks with 165 flats and amenities block along with parking facility. As per the update shared with Projects Today, Niharika Projects is awaiting environment clearance for the project. Work on the project will begin by February 2023. ■



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