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Climate Finance cannot continue at the Levels Decided In 2009; should be at Least USD 1 Trillion: Shri Bhupender Yadav



New Delhi, India: Calling upon the LMDC countries to work closely to protect the interests of develop-ing countries, Union Minister for Environment, Forest and Climate Change, Shri Bhupender Yadav urged that climate finance cannot continue at the levels decided in 2009. It should be at least USD 1 trillion to meet with the goals of addressing climate change.

The Environment Minister was speaking at the Ministerial meeting of the Like-Minded Developing Countries (LMDC) held on 2nd November 2021 on the sidelines of COP 26 in Glasgow. The meeting was presided by the Bolivian President Mr. Luis Alberto Arce Catacora. The participating countries in the meeting included India, China, Cuba, Nicaragua and Venezuela. Underlining the unity and strength of LMDC as fundamental in the UNFCCC negotiations to preserve the interest of the Global South in fight against climate change, Shri Yadav highlighted that recognition of the current challenges being faced by developing countries required intensified multilateral cooperation, not intensified global economic and geopolitical competition and trade wars.

The Environment minister underscored that under the dynamic and visionary leadership of Prime Min-ister, Shri Narendra Modi, India is working on ambitious climate actions in line with sustainable devel-opment priorities. He requested the LMDC members to join hands with India to support the global ini-tiatives it has pioneered, including the International solar Alliance (ISA), Coalition for Disaster Resilient Infrastructure (CDRI) and the Leadership Group for Industry Transition (LeadIT). The Minister also ap-preciated the efforts of the Third World Network (TWN) for its support to LMDC, and expressed the need to ensure resources to TWN.

Efforts to Drive Low Carbon Development Pathways in Industry Sector are Critical for Achieving the Goals of the Paris Agreement: Shri Bhupender Yadav

New Delhi, India: On the sidelines of COP 26 in Glasgow, the LeadIT (Leadership Group for Industry transition) Summit 2021 was held in hybrid mode presided by India and Sweden. Shri Bhupender Yadav, Union Minister for Environment, Forest and Climate Change, delivering the opening re-marks, highlighted that industry sectors together contribute about 30% of the total CO2 emissions, and thus, efforts to drive low carbon development pathways in industry sector are critical for achieving the goals of the Paris Agreement.

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LeadIT is a voluntary initiative for promoting low-carbon transition especially in the hardto-abate sec-tors like Iron & Steel, Aluminium, Cement and Concrete, petrochemicals, fertilisers, bricks, heavy-duty transport, etc. through active participation of private sector companies. Shri Yadav further stressed that although new countries like USA, Austria and Ethiopia, and companies including Skanska, Heidel-berg Cement and Salzgitter have joined the initiative, it is necessary that more companies from the heavy industries should join the global initiative.

"Developed countries should also provide lead markets for products of green technologies and drive down costs so that these can be deployed in developing economies also, at scale, emphasized Shri Yadav.

The meeting was co-chaired by Hon'ble Deputy Prime Minister and Minister of Environment of Swe-den, Mr. Per Bolund, who welcomed the new members in the LeadIT Group and added that industries play an important role in achievement of the net zero target, leading up to achievement of the Paris Agreement goal, and creation of new and green opportunities.

He also underlined on the importance of cooperation between countries and investments for trans-formation to a fossil free future, and on the need to find more friends including private sector and civil societies. He added that public private partnership and creation of demand help in radical emission reductions and creation of green jobs.

Cabinet Approves Mechanism for Procurement of Ethanol by Public Sector Oil Marketing Companies



New Delhi, India: The Cabinet Committee on Economic Affairs chaired by Prime Minister, Shri Naren-dra Modi, has given its approval for fixing higher ethanol price derived from different sugarcane based raw materials under the EBP Programme for the forthcoming sugar season 2021-22 during ESY 2021-22 from 1st December 2021 to 30th November 2022.

Approval is also given for the following:

The Price of ethanol from C heavy molasses route be increased from Rs. 45.69 per litre to Rs. 46.66 per litre, The price of ethanol from B heavy molasses route be increased from Rs. 57.61 per litre to Rs. 59.08 per litre, The price of ethanol from sugarcane juice, sugar / sugar syrup route be increased from Rs. 62.65 per litre to Rs. 63.45 per litre, Additionally, GST and transportation charges will also be paya-ble, Government has decided that Oil PSEs should be given the freedom to decide the pricing for 2G ethanol as this would help in setting up advanced biofuel refineries in the country. It is important to note that grainbased ethanol prices are currently being decided by Oil Marketing Companies (OMCs) only.



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The approval will not only facilitate the continued policy of the Government in providing price stability and remunerative prices for ethanol suppliers, but will also help in reducing the pending arrears of Cane farmers, dependency on crude oil imports and will also help in savings in foreign exchange and bring benefits to the environment.

Government has been implementing Ethanol Blended Petrol (EBP) Programme wherein Oil Marketing Companies (OMCs) sell petrol blended with ethanol up to 10%. Government has notified administered price of ethanol since 2014. For the first time during 2018, differential price of ethanol based on raw material utilized for ethanol production was announced by the Government. These decisions have sig-nificantly improved the supply of ethanol thereby ethanol procurement by Public Sector OMCs has increased from 38 crore litre in Ethanol Supply Year (ESY) 2013-14 to contracted over 350 crore litre in ongoing ESY 2020-21.

Indianoil Rolls Out Green Fuel "Xtragreen" At 126 Fuel Stations across 63 Cities in India

New Delhi, India: On the auspicious occasion of Dhanteras, IndianOil presented two unique customer-centric offerings to delight IndianOil patrons across the country. The company rolled out the cleaner and greener diesel XtraGreen to 126 fuel stations across 63 cities in the country and also launched IndianOil's fuel gift card, One4U.

The rollout of XtraGreen and the launch of One4U was done in the presence of



Shrikant Madhav Vaidya, Chairman, Indian Oil Corporation Ltd

Shrikant Madhav Vaidya, Chairman and other senior officials of IndianOil, including Dr S S V Ramakumar, Director (Research & Development and Petrochemical and Business Development) and Mr V Satish Kumar, Director (Marketing).

Chairman Mr Vaidya commenced the sale of XtraGreen at an IndianOil fuel station at Agra. Speaking during the launch of this green fuel offering, Chairman, IndianOil said, "XtraGreen is in sync with the Hon'ble Prime Minister's commitment to steer India towards a greener tomorrow, constant reduction of carbon emission and gradual achievement of the net-zero goal by 2070. This also underlines IndianOil's unwavering commitment to provide niche and specialized solutions to the environmentally sensitive market segments while continuously enhancing the user experience".

IndianOil's R&D has provided the proprietary chemical formulation in the form of Modified DMFA (Diesel Multi-Functional Additive), which is used for XtraGreen. This fuel offers several benefits over regular Diesel, including improved Fuel Economy by 5 to 6%, reduced Carbon Dioxide emissions (130 grams of CO2





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for every litre of Diesel), reduced Carbon Monoxide emission by 5.29%, reduced NOx emissions by 4.99%, increased Cetane Number by 5 points, improved Lubricity, reduced Engine Noise and excellent Corrosion protection (NACE rating A).

Cairn Announces Technology Partnerships with Halliburton & Baker Huges



Prachur Sah, CEO, Cairn Oil & Gas

New Delhi, India: Cairn Oil & Gas has announced the plan to partner with Halliburton for shale explora-tion in Rajasthan to commence shale exploration targeting the Lower Barmer Hill (LBH) formation of western Rajasthan. Cairn and Halliburton will develop pilot drills to explore the potential of shale in the Barmer basin. The current shale potential here stands at 3 bn barrels and with this partnership, Cairn wants to establish a reserve of 300 mmboe. Prachur Sah, CEO, Cairn Oil & Gas, said, "To achieve energy sufficiency,

India must improve upstream exploration, augment technology for brown fields and en-courage unconventional energy resources such as shale. With this partnership, we are combining the best of global technology with the promise of new-age exploration of unconventional fuels. The ex-ploration and production of shale has revolutionized USA's energy landscape and for India too, the fuel can be a game-changer." Earlier this year, Cairn had also announced the beginning of tight oil pro-duction from the neighbouring Aishwarya Barmer Hill (ABH) site. India is yet to commercially produce shale and this association will be a significant step towards that end.

To increase production from Bhagyam field, Cairn has partnered with Baker Huges to increase produc-tion from Bhagyam oil field. Under this alliance, Cairn will aim to increase its recoverable reserve to 250 mmboe from the present 45 mmboe. The announcements follow the company's commitment of doubling capacity to produce 50% of India's domestic crude and assisting the country in its journey towards energy Aatmanirbharta.

Vedanta Limited (Cairn Oil & Gas business) is a separate entity with no connection to Cairn Energy PLC. Cairn Energy PLC, the Scottish oil and gas exploration company that is also commonly referred to as Cairn Energy, will discontinue the use of the brand name 'Cairn' as part of its corporate identity by De-cember 2021. The brand 'Cairn' is exclusively owned by Vedanta Limited.

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Honeywell introduces Revolutionary Plastics Recycling Technology to Drive a Circular Plastics Economy



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Vimal Kapur, President and Chief Executive Officer, Honeywell Performance Materials and Technologies

Pune, India: Honeywell announced the commercialization of a revolutionary process that expands the types of plastics that can be recycled and can produce feedstock used to make recycled plastics with a lower carbon footprint. The new technology can reduce the need for fossil fuels in the creation of virgin plastics while enabling hundreds of cycles of recycling, with the goal of enabling a circular economy for plastics.

Honeywell's UpCycle Process Technology utilizes industry-leading molecular conversion, pyrolysis, and contaminants management technology to convert waste plastic back to Honeywell Recycled Polymer Feedstock, which is then used to create new plastics. The UpCycle Process technology expands the types of plastics that can be recycled to include waste plastic that would otherwise go unrecycled, including colored, flexible, multilayered packaging and polystyrene. When used in conjunction with other chemical and mechanical recycling processes -- along with improvements to collection and sorting – Honeywell's UpCycle Process Technology has the potential to increase the amount of global plastic waste that can be recycled to 90%.

"Plastics play an important role in our society, including expanding the shelf life of food and making vehicles lighter, which reduces their emissions. Unfortunately, only a fraction of plastics can be successfully recycled," said Vimal Kapur, president and Chief Executive Officer of Honeywell Performance Materials and Technologies. "Honeywell's UpCycle process helps fix this problem. By broadening the types of plastic that can be recycled, UpCycle will revolutionize the plastics economy and play a critical role in improving the sustainability of many of the products we use on a daily basis."

Godrej & Boyce supplies High-Pressure Separators for the Clean Fuel Refinery Project in Thailand



Mumbai, India: Godrej & Boyce, the flagship company of the Godrej Group, announced that its business Godrej Process Equipment,

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has successfully supplied a High-Pressure Separator for the Clean Fuel Refinery Project in Thailand for their Euro V upgradation. This is in alignment with Godrej & Boyce's commitment towards providing solutions that lead to a more sustainable future. The Company has also supplied other critical equipment such as Pressure Vessels, High Pressure Breechlock Heat Exchangers and Columns for this marque project.

The High-Pressure Separator having a design pressure above 160 bar is unique owing to the thickness of the shell wall, which is over 310 mm (equivalent to 6000 stacked papers) and the highest ever made by Godrej Process Equipment. The upgradation project will improve the quality of transportation fuels and primarily focuses on reduction of particulate matter (pm) and nitrogen oxides (NOx) emissions.

Commenting on this milestone, Hussain Shariyarr, Senior Vice President & Business Head, Godrej Process Equipment said, "Godrej Process Equipment has been one of the global leaders in the fabrication of highend essential static equipment for the Process Industry for decades. It is a privilege to be able to contribute to the prestigious Clean Fuels Project in Thailand by manufacturing this High-Pressure Separator along with other critical equipment. Meticulous planning during design & sourcing coupled with the use of advanced technologies & automation during the manufacturing process has helped in meeting the stringent quality and dimensional requirements of this project. It is also a milestone for Godrej Process Equipment, as this is the first time that we have manufactured an equipment of this thickness.

We plan on increasing our capabilities by winning new orders with higher complexities in the near future. We also look forward to contributing in similar clean fuel projects."

Rossari Biotech Ltd. appoints Debashish Vanikar as CEO, Surfactants & Silicone Business



Debashish Vanikar, CEO, Surfactants & Silicone Business, Rossari Biotech Ltd.

Mumbai, India: Rossari Biotech Limited, a Speciality- Chemicals manufacturer providing intelligent and sustainable solutions for customers across industries, announced the appointment of Mr. Debashish Vanikar as the CEO, Surfactants & Silicone Business. A seasoned strategist and Business Manager for the last 21 years, Debashish will be leading the integration of Rossari with its new acquisitions and driv-ing accelerated growth of the group through these new businesses. He will be based out of Mumbai.

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Commenting on the appointment, Sunil Chari, Managing Director & Co-Founder, Rossari Biotech Ltd. said, "Rossari is on a very crucial growth phase and is looking at organic as well as inorganic growth op-portunities simultaneously. We are confident that Mr. Vanikar's experience in leading Strategy, Integration, Scaling New Businesses & Brand Transition will help us redefine our business and achieve new successes as a leading player in the industry. He will play a key role in integrating the recent acquisi-tions of Rossari to our Group's vision, business goals and culture. We welcome him onboard and look forward to a lasting professional relationship."

In his two decades of professional journey, Debashish has worked across B2B industries like adhesives, cement, chemicals and paints. He has led many business transformation and integration projects across different geographies.

Sharing his thoughts, Mr. Debashish Vanikar, CEO Surfactants & Silicone Business, Rossari Biotech Ltd. said, "I am excited to be part of the Rossari family at a juncture when the company is looking at con-sistent growth from businesses across the group. I believe while acquisitions are a great vehicle to grow, effective integration of entities into the business is a critical success factor. I am looking forward to the journey of absorbing the new businesses in the Group and aligning business goals and cultures while at the same time ensuring profitability. Additionally, I am keen to see Rossari make its leap in their Digital transformation journey across all functions."

Huntsman Wins FICCI Award for Excellence in Manufacturing of Dyes & Dyestuff



Mark Devaney, Vice President Manufacturing and Operations Excellence, Huntsman Textile Effects.

New Delhi, India: Huntsman, a global manufacturer and marketer of differentiated chemicals, has won the coveted award for excellence in manufacturing of Dyes and Dyestuff and remarkable contribution towards the chemical and petrochemical industry by The Federation of Indian Chambers of Commerce & Industry (FICCI), a leading Industry federation of the country.

The awards ceremony was graced by Shrimati Anupriya Patel, Honorable Minister of State, Department of Commerce, Ministry of Commerce & Industry, Government of India, who also presented the award to Kavishwar Kalambe, Site Director, Huntsman Textile Effects last evening.

"We are extremely honored to receive the award from FICCI for our commitment to manufacturing excellence in the Dyes and Dyestuff category. This recognition reaffirms



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our position as a leading global manufacturing company focused on developing sustainable solutions for the textile industry worldwide, as well as augmenting our vision of sustainability aligned to the environmental, social, and governance frameworks." said Mark Devaney, Vice President Manufacturing and Operations Excellence, Huntsman Textile Effects.

Clariant launches major Climate Campaign: Free N2O-removal Catalyst for Nitric Acid producers worldwide

Muttenz, Switzerland: - Clariant, a focused, sustainable and innovative specialty chemical company, launched a major global campaign to reduce the climate change impact of nitrous oxide (N2O). Drawing on decades of catalyst research expertise, the company has developed the EnviCat N2O-S catalyst, which is proven to remove up to 95% of N2O generated as a by-product of nitric acid production. Clariant is now offering a free fill of EnviCat N2O-S to 10 nitric acid producers who do not have N2O off-gas treatment in place. Through the campaign, the company intends to help avoid greenhouse gas emissions equivalent to several million tons of CO2 every year.

Of the approximately 500 nitric acid plants operating globally, more than half run without N2O abatement, mostly in regions without applicable emission control regulations. Clariant now aims to tip the balance towards more sustainable production processes. The company is offering a free first fill of EnviCat N2O-S catalyst to up to 10 nitric acid producers who currently do not use an N2O abatement catalyst.

Hans Bohnen, Chief Operating Officer at Clariant, commented, "Sustainability is no longer an afterthought of business; it is central to what we do and requires action now. That's why we announced new ambitious sciencebased climate targets for Clariant. But as a specialty chemicals company we can do more: I am therefore particularly proud to announce that we have committed a substantial investment to help nitric acid producers worldwide virtually eliminate their N2O offgas emissions. This benefits the climate, while also helping the nitric acid manufacturers to minimize their carbon footprint and progress on their sustainability journey."

Stefan Heuser, Senior Vice President and General Manager of Clariant Catalysts, stated, "Our aim is to provide a considerable contribution to environmental protection. While N2O is extremely harmful for the climate, it is easy to reduce with our catalysts. We believe that once those nitric acid producers experience the benefits – with a free-of-charge catalyst and without obligations – they will be ready to change."

Grundfos Brings Efficient Pumping Solutions to Nereda® Wastewater Customers

Bjerringbro, Denmark: Grundfos, the world leader in pumps and water solutions announced that it has been selected by Royal HaskoningDHV as 'Preferred Supplier' to its award-winning Nereda wastewater



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treatment technology. This formal agreement will allow Grundfos to be listed as the Preferred Supplier of pumping solutions for Royal HaskoningDHV's Nereda Wastewater Technology offerings.

Nereda is the sustainable and cost-effective wastewater treatment technology that purifies water using the unique features of aerobic granular biomass. With over 90 projects completed or being delivered across the world, Nereda is a well-established technology for both municipal and industrial use. Through this partnership, Grundfos and Royal HaskoningDHV will be working closely together in bringing the highest quality and the newest innovation to the wastewater industry.

Commenting on this strategic alliance, Henrik

Sonesson, Global Key Account Director –
Water Utility, Grundfos, said "Reliability is key when it comes to collecting, transporting and treating wastewater. Our products and solutions for wastewater transport and the wastewater treatment plant build on reliability, modularity and energy-efficiency from optimised pump systems and fully integrated solutions."

Adding to this, René Noppeney, Global Director of Water Technology Products at Royal HaskoningDHV, said "Our goal is to continually improve the technology and services that Nereda Wastewater Technology provides to our customers. This is made possible through our Preferred Supplier program that establishes collaborations with industry leaders, such as Grundfos. By adding Grundfos to our Preferred Supplier program we are not only providing our customers with the option of reliable and efficient pumping solutions, but aim to promote inter-technology research and development, to enhance our joint offerings on Nereda projects."

Man Industries (India) FY22 Total Income stood at Rs. 9,114 million

Mumbai, India: MAN Industries (India) Limited, one of the leading Large Diameter Pipe manufacturing company, has announced its unaudited financial results for the quarter and half year ended September 30th, 2021. The company reported a Total Income of ₹ 5,011 Million in Q2 FY22 with an EBITDA of Dr. R.C. Mansukhani, Chairman, MAN Industries (India) Limited

Rs. 532 million. The EBITDA Margin stood at 10.6% an increase of 47 bps over Q2 FY21. Profit after tax for the second quarter stood at Rs. 245 million with a margin of 4.9% The unexecuted order book as on date stood at approx. ₹ 13,500 Million, to be executed in the next 6 – 7 months. The company continues to have a robust book of outstanding bids for more than ₹ 1,50,000 Million at various stages of evaluation for several Oil, Gas and Water projects in India and abroad. The company therefore expects good order inflow in near future.

Commenting upon the performance, Dr. R.C. Mansukhani, Chairman, MAN Industries (India) Limited, said "I am happy to share that our company has registered a revenue of Rs. 9,114 million for the first half of the financial year. The EBITDA and PAT stood at Rs. 982 million and Rs. 438 million respectively. We expected the revenue to be higher but one special steel required to execute a particular

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project which was to be imported from Germany got delayed on account of flood in the German region. The project will be executed in the third quarter.

Yokogawa Wins Water Supply Management System Order from National Water Company of Senegal



Tokyo, Japan: Yokogawa Electric Corporation announces that its subsidiary Yokogawa Solution Service Corpo-ration along with Toyota Tsusho Corporation have received an order from Société Nationale Des Eaux Du Sénégal (National Water Company of Senegal) for the construction of a water supply management system. The work is to be undertaken as part of the Mamelles Sea Water Desalination Project, which is being financed by a loan from the Japan International Cooperation Agency. The construction of this water distribu-tion network monitoring system will stabilize water supply and improve service throughout the Dakar Re-gion. This is Yokogawa's first order for a water supply management system in Senegal.

Around 80% of Senegal's industrial activity takes place in Dakar, and the population of this city has been in-creasing in recent years. In addition to looking for ways to ensure a safe supply of water to this city, Senegal is working to diversify its water sources and reduce loss from water leakage.

The water supply management system to be constructed by Yokogawa Solution Service and Toyota Tsusho will improve access to the water pipe network and thereby ensure the supply of safe water to Dakar. Yokogawa Solution Service will install sensors to collect flowrate and pressure data at around 200 locations in Dakar's water pipe network and construct a water supply management system that is capable of locating water leaks and other such problems. This will contribute toward the achievement of the project goals, which call for the achievement of at least a two million ton reduc-tion in annual water losses caused by leaks in the water pipe network, and an increase in the 24-hour water supply rate from the current 70% to 100%.

To improve the supply of safe water in emerging and developing countries, Yokogawa Solution Ser-vice and Yokogawa Group companies will leverage the rich track record and wealth of water supply and wastewater treatment know-how that the company has gained in Japan.

The Project Overview- Location- Dakar Region, Republic of Senegal, Customer-National Water Company of Senegal, Scope of work- Dakar water supply management system construction, Water pipe network monitoring system, Water leakage management system, District metered area remote monitoring system and, Training in operation of the above systems. The Expected completion would be in the First half of 2024. ■



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Indianoil to set up India's First Mega-Scale Maleic Anhydride Plant at Panipat

said, "Presently, these high demand chemicals are mostly imported by India. The upcoming MAH Plant will reduce



import dependence and save foreign exchange of about USD 150 million per year, thus strengthening the mission of Aatmanirbhar Bharat. Moreover, petrochemicals integration is the cornerstone of our future growth strategy, given the high potential of petrochemicals in India. "

IndianOil Board has greenlighted the setting up of India's first mega-scale Maleic Anhydride Plant to manufacture value-added chemical products at its Panipat Refinery and Petroleum Complex (PRPC). The project with CAPEX of Rs 3681 crore will be commissioned in 54 months from stage 1 investment approval. The project is proposed to have a capacity of 120 KTA (Kilo Tonnes per Annum) of Maleic Anhydride (MAH) that is used to make speciality products like polyester resins and surface coatings plasticizers, agrochemicals and lubricant additives. The plant will also manufacture 20 KTA of 1,4-Butanediol (BDO) that finds applications in Poly Urethanes (PU), Poly Butylene Terephthalates (PBT) - an engineering grade plastic and biodegradable fibres.

Speaking on the newly approved Project, Mr S M Vaidya, Chairman, IndianiOil,

The ongoing expansion of the Panipat Refinery (envisaging capacity expansion of the refinery from 15 MMTPA to 25 MMTPA) and the implementation of petrochemical and other specialized units will make this Refinery one of the most advanced and integrated refinery and petrochemical complexes in Asia, with a complexity index of over 15. The expansion blueprint includes units like Indmax for deriving maximum value from the petrochemical molecule, Polypropylene unit and a Lube complex for producing lube oil base stock apart from other refinery units. The existing Olefinic and Aromatic complex shall also be expanded along with the implementation of grass-root speciality petrochemical units like the Styrene unit and the just-approved Maleic Anhydride Unit.

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Grasim Industries Ltd Commissions Chloromethane project at Vilayat Unit, Gujarat

Grasim Industries Ltd has authorized Chloromethane (CMS) project at Vilayat Unit, Gujarat having limit of 150 Ton Per Day (TPD)/50,000 Ton Per Annum (TPA). This will result into an extra annualized income of ~Rs. 400 Crore.

Shares of Grasim Industries Limited was last exchanging BSE at Rs. 1791.15 when contrasted with the past close of Rs. 1786.15. The complete number of offers exchanged during the day was 7128 in more than 966 exchanges. The stock hit an intraday high of Rs. 1800.45 and intraday low of 1784.75. The net turnover during the day was Rs. 12770564.00.

Thirumalai Chemicals New Investment Project in Dahej Unit

The Board of Thirumalai Chemicals Ltd (TCL), has approved the investment in a project to manufacture Phthalic Anhydride and Fine-chemicals at its site in Dahej in Gujarat, India. The investment will be funded by TCL's internal accruals and borrowings.

The project includes a 90,000 ton per year Phthalic Anhydride plant. It is scheduled for commissioning in H2 FY23-24. TCL already operates a Phthalic Anhydride plant at this site, commissioned about 6 months ago. The Project will use in-house Technology. Phthalic Anhydride is used widely to make colorants, resins for construction, infrastructure & housing, additives for polymers and inks.

TCL manufactures about 150,000 tons of Phthalic Anhydride, Food Ingredients and Fine Chemicals at its existing sites in Ranipet and Dahej combined. TCL also manufactures about 50,000 metric tons of Maleic Anhydride & derivatives from Butane at its wholly-owned subsidiary in Malaysia.

TCL is currently implementing a large integrated Butane to Maleic Anhydride and Food Ingredients (Malic, Fumaric acids & other derivatives) production facility, through a 100% owned stepdown subsidiary in the United States. This facility is expected to be started-up in H2 FY23-24. TCL already produces these products in India and Malaysia since 1991.

tkIS India bags EPC Contract from Numaligarh Refinery Limited Awarded

Numaligarh Refinery Limited awards EPCC-1 package for CDU/VDU project to thyssenkrupp Numaligarh Refinery Limited (NRL) has awarded an EPC Contract to thyssenkrupp Industrial Solutions India (tkIS India) in the range


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Rajesh Kamath, CEO and Managing Director, thyssenkrupp

of approximately USD 155 Million to execute their 6.0 MMTPA Crude Distillation Unit and Vacuum Distillation Unit with Amine Treating Unit project on LSTK basis at their refinery located in Assam, India.

NRL, as part of Numaligarh Refinery Expansion Project (NREP), is expanding its refining capacity from the current 3 MMTPA to 9 MMTPA by installing a new 6 MMTPA capacity CDU/VDU and associated downstream process units, utility & offsite.

The scope of EPC work of this project includes Engineering, Project Management, Procurement, & Supply, Inspection & Expediting, Construction Management & Supervision, Mechanical Completion & Pre-commissioning of Plant, Commissioning, Start up, PGTR & Hand over of plant. "This is a landmark project for tkIS India and the foundation of a strong pillar in our association with Numaligarh Refinery as it takes its expansion plans forward. This will further foster our position in the Indian market as a leading EPC player in the field of refineries and petrochemicals", said Rajesh Kamath, CEO and Managing Director of thyssenkrupp's chemical plant businesss.

tkIS is also offering its EPCM services for the new 2 MMTPA (PFCC) unit, (LPG) treatment unit, GHDS unit, MS blocks having NHT, CCR and ISOM units for the NRL refinery. thyssenkrupp Industrial Solutions India Private Ltd. is a leading EPC and engineering consultancy offering solutions across different sectors viz. Petrochemical and Refinery, Fertilizers, Chlor-alkali, cryogenic storages etc. It has executed more than 850 projects in the last four decades. With this project, thyssenkrupp Industrial Solutions India Private Ltd. has cemented their position in the industry as a strong EPC contractor.

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Meghmani Finechem moving up the Speciality Value Chain



Maulik Patel, Chairman & Managing Director Meghmani Finechem Limited

Meghmani Finechem Limited, a leading manufacturer of Chlor-Alkali products and its value-added Derivatives, on Thursday announced its expansion plans into Chlorotoluene and its value chain. The upcoming facility in its existing Chlor-Alkali Complex of Dahej will produce intermediates for manufacturing pharmaceutical and agro-chemical active ingredients, which are amongst the fastest growing segments.

The Chlorotoluene project is expected to be commissioned by Q4FY24 and would require a capex of ₹ 180 Cr which will be fully funded through internal accruals. Meghmani Finechem Ltd expects annual revenue of Rs. 300 Cr from this project. The EBITDA margin is expected to be in range of 28% - 32% which is in line with company's overall margin guidance. Given the high asset turnover ratio of 1.6x, absolute EBIDTA will be high leading to ROCE of nearly 30%. This will boost up the 24% ROCE target by FY2024.

This is a first of its kind intermediate facility which will be backward integrated with Toluene Chlorination (Ring Chlorination) plant in India. This entails a new set of opportunities for value addition of chlorine for an entirely new vertical. Indian Chlorotoluenes and its value chain demand are fulfilled through imports and hence, this facility will cater to the requirement for domestic and export market. This will also contribute in "MAKE IN INDIA" initiative to become Atmanirbhar Bharat, launched by our visionary Honourable Prime Minister.

Mr. Maulik Patel, Chairman & Managing Director said: "We are extremely excited about the new project, which further strengthens our product portfolio and makes us a diversified and fully integrated Specialty chemical player. Our focus at MFL is to create superior shareholder value and this new high ROCE product is a step in that direction. We are also very thrilled about setting up an advanced and world-class R&D facility, which will definitely catapult our company to a higher growth trajectory."

Documentum Management System in Construction Project

The article intends to provide guidelines and procedures to establish the appropriate document control system for any construction project. More precisely, the author briefly explains the process for controlling the documents required for construction project that has a Quality Management System (QMS) in place. It sets out the organisation's standards for internal documents and procedures for managing document-control tasks.

Ρ

roper documentation and systematic management of documents are the foundation of any construction project

as they guide the execution and provide credible supporting evidence in case of claim and arbitration. Reliable evidential documentation not only substantiates a claim but also plays a key role in filing & defending the same.

In the emerging scenario of large & complex construction projects, proper documentation and digital record-keeping have become significant. The world is moving towards digitization, and recordkeeping in digital format will not only save huge costs but also be much easier to track and retrieve. The responsibility is upon contractors to provide supporting evidence justify each claim which has to pass through process. Right analysis, assessments, and ample documentation is essential for sustaining a claim.

Challenges in Document Management

- Ease of accessibility- Finding the right document at the right time. Tracking & timely finding the required documents is a painstaking exercise.
- Document Modifications- Accurate recording of any change/ variance in documents at the construction site.
- Version Management- Recording various changed versions of documents with accuracy to

FEATURES

Essential elements of claim damages

Breach

Harm / Damage suffered

Casual link between breach & loss

substantiate any future claims.

 Locational Hindrances- Documents scattered in different offices due to the absence of a centralized document management system.

There are three essential elements of a claim of damages which need to be present and to be proved by the claimant that are, the breach, the harm or the damage suffered and casual link between the beach and the loss. For a claim to be successful, harm should have been suffered by the claimant by a breach of the defendant. The cause of the loss should be the breach of the defendant, and the loss should flow naturally from the breach. The loss is said to flow naturally if the claimant could not resist the loss.

The normal procedure to prepare a claim is to first include a short narrative of the works and then explain the above three elements in separate sections so as the court or the arbitrator is clear that all the three elements are present and that the claim has been forwarded properly. The normal difficulties faced by the claimant in any claim is gathering the documents which form the evidence for the above three requirements. As documents are the primary source of evidence rather than oral testimony, the claimant should maintain proper records of works and the what transpired, missing documents may lead to the claim being dismissed because the claimant could not prove his claim.

Why Do We Need Document Control System?

Document control creates a focal point where all project related communication and documents are logged and tracked. Similarly, the intention of document control is to ensure that all project related documents and correspondence are handled when necessary and promptly. As we know, any delay in processing the essential documents and correspondence (in a construction project/contract) could cause a tremendous impact on the overall completion of the project in terms of time, cost over-runs and quality. Hence, document control is an essential ingredient of construction management and project delivery and should not be taken lightly. Also, the complexity or

the degree of intensity of the document control in a construction project depends on the size of it.

Who is Responsible for Document Control?

The QMS documentation comprised of plans, procedures, checklists, forms and work instructions based on the ISO9001 documentation as mentioned before. More specifically, it addresses the quality issues including contractual and legal obligations. Hence, the responsibility of document control must be on responsible staff attached to any construction project. Also, it depends on the size and complexity of the project.

Construction Manager (CM)

For example, the Construction Manager (CM) of the project should ensure that all project related communication or correspondence (Verbal & Written) and documents are properly routed. The CM should ensure that all project related correspondence and documents are transmitted through the designated Document Control clerk for processing.

Similarly, staff responsible for document control including the designated support staff should be made responsible for entering (or recording) or logging in all incoming and outgoing project related correspondence and documents into the document tracking system. Also, the document control staff is responsible for keeping accurate construction records right throughout the project period. In the case of small construction project, document control is handled directly by the CM or designated Project Quality Representative (PQR).

Role of Document Controller

A document controller may have control of a single document or a number of documents or a collection. Every controlled document must have a document controller. The role of document controller may have any of the following tasks:

- Keep all documents related to construction safe from tampering or corruption.
- Distribute documents relevant parties promptly using the document tracking system logs
- Maintain document registers. Logs and distribution lists
- Collect and maintain document distribution records.
- Manage document change
- Withdraw superseded documents and archive them
- Communicate any changes

Document Control

Inspection and testing documents

All contractor and 3rd party completed inspection and testing reports shall be submitted to Construction Manager and designated document controller. These documents have to be filed in accordance with the administrative procedures of the construction company. Similarly, these documents have to be analysed and processed as per the Control of Quality Records as stipulated in the QMS of the construction company.

44 • Procurement/Purchase of Quality Items

All documents on purchases will have to be filed and maintained throughout the construction project duration. At the completion of the construction project, this documentation has to be processed according to the procedures stipulated in the Control of Quality Records.

It is important to make sure that all packing slips, invoices, drawings, mill test reports, specifications, material safety data sheets, supplier documentation (received with shipment or delivery) are properly controlled and transmitted to the Construction Manager or the designated Document Controller.

The main contractor should maintain a

receipt inspection log of all items received. Such receipt inspection logs (including storage & handling procedures) should be available during the construction period for review by the Construction Manager or the Document Controller.

In essence, all relevant documents should be filed, stored and maintained throughout the construction project duration. At the completion of the project, this documentation shall be processed in accordance with the Control of Quality Records of the QMS.

Product Identification and Traceability

Documentation that verifies identification and traceability of products (such as Concrete) have to be filed and maintained during the construction process. This documentation ensures whether certain products or work is carried out in compliance to the specifications and procedures. At the completion of the construction project, this documentation shall be processed in accordance with procedure Control of Quality Records.

Process Control

It is important to document all written process procedures and discussions regarding special processes used in the construction project. This documentation should be forwarded to the Construction



Manager or the designated Document Controller. All such documentation need to be filed and maintained during the project duration. At the completion of the project, this documentation shall be processed in accordance with procedures stipulated in the Quality Records of QMS.

The importance of this documentation is because many processes in the construction project may require prequalification. In other words, such pre-qualification involves, review of processes in order to ensure conformance industry standards and manufacturer's recommendations, job specifications and procedures. Also, sound monitoring and evaluation is involved to ensure the expected results are achieved.

Civil Inspection

The all documentation related to civil inspection has to be properly logged and filed in order to ensure that civil construction activities are performed in accordance with applicable codes, standards, specifications and drawings.

For example, such documentation should cover the general inspection criteria in the areas: Survey Control, piling inspection, soils inspection, structural steel inspection, reinforcing steel inspection, concrete inspection and many other activities. These inspections should be documented in accordance with applicable job specifications, national codes and practices or standards.

Occupational Health & Safety

All documentation related to safety inspection reports should be forwarded to the Construction Manager and the designated Document Control staff of the project. This documentation has to be periodically updated and kept at the project office throughout the project duration.

How to Manage Document Control?

In a small construction project, document control can be in the form of maintaining several hand written logs. In general, the essential documents to be tracked can be the following:

- General Correspondence (incoming & outgoing)
- Shop Drawings
- Request for Information (RFI)
- Progress Reports
- Clarifications on Drawings/Plans
- Change Orders
- Progress Payments
- Site Safety Inspection Reports
- Inspection & Testing

Hiring a Document Controller -Nature of the Job

A Document Controller maintains and manages all important documents either for a particular project or whole organization and assures that it is easily accessible and stored. He or she also maintains and examines related files to release blueprints, drawings, and engineering documents to manufacturing and other operating departments.

Basic Tasks:

- Coordinate all activities related to the Document Control procedure, including technical documents, drawings, and commercial correspondence.
- Input document data into the standard registers ensuring that the information is accurate and up to date.
- Generate the various document control reports as required.
- Typing of site documents, and follow up of all the site needs
- Makes sure that controlled copies of latest approved documents and drawings are given to the appropriate staff, subcontractors and suppliers as applicable
- Maintain updated records of all approved documents and drawings

and their distribution clearly

 Maintain the documents and drawings in the Document Control office under safe custody without any damage or deterioration with easy traceability. Maintain the files and control logs as required by the project.

Education and Training Requirements

- At least Vocational Diploma/Certificate from a 2-year technical course
- At least 3 years related work experience in office work, documentation and control Knowledge of Engineering disciplines like Civil, Mechanical, Electrical, etc.

Skills and Competency Requirements

- Knowledge in use of spreadsheets, database, word processing and selected job specific software.
- Ability to keep clear and accurate records and reports.
- Ability to use computer and rapidly input data and retrieve records and information. Ability to organize work load and to manage a filing methods and management
- Techniques
- Good Communication skills

Work Environment

The job of a document controller involves going in and out of the office as they visit construction sites from time to time.

Employment Opportunities

Document controllers work for construction companies and since the construction industry is booming in many First World Countries, employment opportunities abound for them overseas.

Conclusion

It is recommended to install a proper Documentum Management System by each organization which shall include scanning of document, storage of documents, sequencing/collating of documents, Validation of Documents, permanent storage and distribution which is ideal evidential proof for pursuing claims/litigation in the long run too.



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Author

Rashid Hussain Executive Director 3C Corporate Consulting Contracting

"Firm roadmap with timelines leading the path to Net- Zero"



Davendra Kumar Managing Director Technip India Ltd.

48 Davendra Kumar brings to the table 35+ years of extensive experience with the Hydrocarbons Contracting Industry. In this extensive Q&A with CEW, Mr. Davendra has shared profound information around the EPC industry beaming with Energy Transition measures, Technology, Manufacturing, Infrastructure, among others.

What does Energy Transition mean for the EPC industry? Please share your views. Kind of shifts this will lead to across the EPC industry value chain?

Energy Transition (ET) in the EPC industry, like in any other industry, is the shift in the energy used for various purposes across the manufacturing process. Besides the use of renewables and green molecules, even improving energy efficiency / reducing carbon footprint in a refinery is an integral part of the Energy Transition process. We are already seeing several changes in the EPC value chain of Oil & Gas and related markets including increasing use of Green Hydrogen instead of conventional Grey Hydrogen in various refinery processes. ET drive will call for more standardization, modularization, value engineering, digitalization to ensure repeatability and strong process integration capabilities. This drive will also bring together stakeholders from various industries to deliver cost-effective integrated solutions.

A lot more use of high value engineering centers like the Indian office for global projects will be a necessity to bring down costs.

Oil and Gas EPC players need to get domain knowledge in new areas like Solar Power, Electrolyzers, Biochemistry processes etc.

Also, the size of many EPC projects will be smaller at least in the near future till the technology is fully proven and also have a lesser schedule to what we are used to in the Oil and Gas industry. It requires multiskilling and faster response/flexibility to deal with such projects.

Further, ET projects could be not only in our traditional business areas of refinery, petrochemicals, fertilizers, chemicals but also in sectors like power, steel and cement.

- Anticipated changes in project complexities

Project complexities shall be of varying nature, as it is currently as well – the biggest challenge is to deliver a costeffective solution that will make projects economically viable on a standalone basis. Projects will see more modularization and standardization. Complexities arising from ensuring reliable and continuous energy including renewable energy, feedstock availability, and green molecule generation to ensure downstream processes are not hampered will also require efficient engineering & design. Further, the urgency of the situation calls for scaling up / commercializing new/absorbing knowledge on novel technologies at a rapid pace.

Also, clients are looking at not only EPCC scope but even operation & maintenance for at least a few years till the operators become familiar with the new technologies.

To address the climate emergency, many project owners will have to reconsider / are already reconsidering the pre-planned projects to align with the obligation to reduce emissions & comply with the stricter environment norms. How has this impacted the projects that are already at the stage of implementation and will affect the future projects?

At T.EN, we have a strong commitment towards the environment. Our strong Process Technology & Engineering Teams ensure through strong value engineering capabilities that the units we engineer have an integrated and optimized design lowering utility requirements with reduced emissions. That being said, with a drive to minimize emissions, we see projects in the future will be more integrated in nature – will require carbon capture and utilization units, use renewable/green feedstock, renewable energy etc.

In India, the current sanctioned projects are going ahead as planned. Petrochemicals growth is high and such projects will also continue in the future. There may be requirements from international investors to demonstrate the lower carbon footprint in technology selection or have a plan to future proof / readiness for the future e.g. say using electric drives (which could use green power) instead of steam turbines etc.

Besides this, projects in ET space may be of a smaller capacity initially to demonstrate new systems and technology and these maybe rapidly scaled up thereafter.



Waste Plastic to Diesel Plant Commissioned at Dehradun

Which technologies will set the tone of decarbonization in the immediate future in context with India & for the future to lead to Net Zero eventually?

Decarbonization will be brought about by mainly the steady transition to Green Hydrogen and downstream to ammonia /methanol etc. and the use of Carbon Capture and Utilization technologies. To reach Net-Zero, a dynamic shift will be needed across all sectors including Oil & Gas, Transport, Infrastructure, Power etc. – many models predict the changes needed to reach Net-Zero by 2050 or beyond – but of course, use of technologies that are inherently clean in nature (without the carbon molecule e.g. Green Hydrogen) will be the first step followed by the capture of released "C"

Further, recently executed pilots by us like IIP Dehradun Waste Plastic to Diesel and IOCL Hydrogen Rich CNG Project at Rajghat, Delhi (to name a few) also form stepping stones to the path to Net Zero.



HCNG Station at Rajghat Depot-Delhi

New path breaking projects bagged by your organization

Technip Energies India has a strong focus and footprint in the Energy Transition space. We recently secured an EPC from NTPC, Vindhyachal for the first 5 MW PEM based Green Hydrogen facility. Besides this, we are working on multiple studies across the iron & steel, fertilizer, refining & petrochemicals space which should eventually go into the execution phase which we are well placed to take up. We have recently secured a 3rd generation Ethanol Detailed Feasibility Study from SAIL in India in the steel sector again, another first-of-a kind project.

We are midway providing EPCM services for the HPCL 2G ethanol plant in Bhatinda.

We are also working with our Group on several global projects which involve CO2 capture, liquefaction, compression, storage waste rubber tires to value, ethanol to ethylene using our Hummingbird technology, Sustainable Aviation Fuel etc

Key focus areas & targeted markets for your organization.

Energy Transition, as a whole, is the target focus for Technip Energies globally and in India. We have 4 main verticals of ET: i. Sustainable Chemistry, ii. Decarbonization, iii. Carbon-free Energy Solutions, iv. LNG. We are focusing on these pillars of ET in our traditional markets as well as adjacent markets like iron & steel, cement, power etc. as ET requires a collaborative effort to make systems reliable, scalable and be cost-effective.

Please share your thoughts on the impact of this trend on downstream chemical processing industry which continues to depend on the Oil & Gas industry for feedstock despite significant discussions on shifting to green chemicals for quite some time. What kind of opportunities are expected to open up for engineering services & capital goods sector?

ET is the need of the hour and the future. That being said, the technologies are relatively new and are not of the manufacturing scale that conventional / proven Oil & Gas systems are running at. Since the demand for Chemicals and Petrochemicals is increasing, new capacity addition is still through the Oil & Gas market route but will see a slow change in the years to come. For example, the use of circular economy in a steam cracker value chain (waste plastic is converted to pyrolysis oil which is sent as feed to a steam cracker) will yield circular/ recycled/green Ethylene and Propylene. This when processed in petrochemical units produced circular Polyethylene and circular Polypropylene. The change has begun and will continue in the years to come - however, the Oil & Gas market / traditional feedstock will still be needed what we use it for, how we use it and how much of it we use will change.

With any shift in the energy pool, significant opportunities open up right from technology development/launch to execution of novel / new projects. Within these boundaries, manufacturing of proprietary goods/material, engineering services, project execution & integration etc. are all opportunities waiting to be tapped especially in a country like India which is a strong manufacturing hub and has the resources to support engineering activities for Indian and Global projects.

How are you driving the change in your organization across skills development, digitalization & expansion of technology portfolio?

At Technip Energies in India, we have one of the strongest Process Technology teams who are working on a variety of versatile projects, gaining experience and exposure in India and on overseas projects, supporting our parent offices. Multi-Skill development and continuous learning is an ongoing process and is strongly promoted through various initiatives like "Expert" talks, Training Modules and R&D Institute / Industry interaction.

As far as digitalization is concerned, we have set up a dedicated digitalization team to identify opportunities to streamline internal work processes as well as develop external offerings in niche areas such as Process Plant Optimization tools along with our Paris office.

On the technology portfolio front, we

are constantly improving our in-house technology offerings by making them more efficient/green. Further, through partnerships & alliances, we are expanding our portfolio/offering to cover the entire ET gamut.

What are your views on changes in investment space & opportunities for Indian EPC players in India & globally?

Investment in the ET space is seeing a lot of traction as all acknowledge – it is the future. Investments are focused on R&D, Pilots / Proof of Concepts for newer technologies and towards "Make in India" to have optimized cost for proven systems.

In India, we are seeing a lot of push and focus on Green Hydrogen. There is a plan to replace 10% of the grey H2 used by refineries with Green H2 in the near future – opportunities in this regard are already surfacing. Further, the use of Green Hydrogen for mobility either by itself or through blending and for Green Ammonia / Urea are also areas of dear interest.

Globally, as in India, there is a focus on Green Hydrogen but also a strong focus on Carbon Capture and Utilization and Sustainable Chemistry opportunities.

What are the biggest gaps that need to be addressed for Indian EPC services providers & allied capital goods sector to leverage the opportunities to become global procurement hub in the true sense?

The biggest gap is towards Technology transfer & manufacturing in India which needs to be bridged to bring down costs and improve availability of capital goods in the sector. Further, a proper understanding of developing proper skills and infrastructure for setting up the required infrastructure to ensure the system operates per design intent with optimized cost.

Your suggestions on Regulatory & policy level support for EPC and allied sectors.

The ET technologies are relatively new, investments will be at a smaller capacity till they are more mature and ready to match the scale of their respective conventional processes. Due to this, the ET projects do not make the best business case for owners – hence, they are hesitant to invest much in this space. Regulations and Policies should promote/incentivize ET projects through subsidies on green projects, "C" tax on emissions, promote circular economy/recycling projects etc. There must be a defined incentive for investors and a penalty for those who do not comply. A firm roadmap with timelines must be chalked out to drive ET and also charter the path to Net- Zero. This will open up more opportunities for EPC players while ensuring EPCs are not facing losses to promote ET projects.



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The Fine Balance of Digital Prowess Enabling Energy Transition



Sathiamoorthy Gopalsamy Managing Director Tecnimont Private Limited (TCMPL), India

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Sathiamoorthy Gopalsamy is currently the Engineering, Technology and R&D Vice President of Tecnimont S.p.A and of Tecnimont Private Limited. Mr. Gopalsamy speaks about the company's major digital strategies, how it paved way for successful project execution, and Energy Transition.

How did Maire Tecnimont Group go through changes and grasp opportunities amid pandemic?

The pandemic did bring in jet-speed acceleration in technology adoption and digital transformation across the business spectre. Over the years, digital transformation has been a game changer of a sort for most of the industries, including the Engineering, Procurement & Construction (EPC) segment too, as it is contributing immensely towards the energy transition for several oil & gas companies. Although the EPC sector per se has a wide employee base, the delay in digital transformation under the energy transition scenario has been a deterrent, compared to other industries such as financial services, logistics, media, retail, etc. However, the tide has been steadily changing for the good over the past few years. In a challenging scenario, our Milanbased Maire Tecnimont Group, a leader in the natural resources processing industry with a global track record in plant engineering, mainly in downstream oil and gas, petrochemicals, and fertilizers, has been a technology-driven player working actively to provide solutions for the energy transition and green chemistry to meet its clients' expectations of decarbonisation. The Group provides clients with services and know-how ranging from conceptual studies, through technology selection, to process engineering and detailed design up to the execution of full EPC turnkey projects with a strong commitment to quality, health, safety and the environmental standards.

With a well-defined Digital Strategy, as enabler that may contribute to industrialize the green chemistry initiatives, which includes focusing on the areas of Cyber Security, extensive IoT application, Process modelling, Artificial Intelligence, Virtual Reality, Augmented Reality, Workers geotracking along with embracing a smart working culture.

Tell us about your product NextPlant, the digital transformation?

The digital transformation program has two main areas; the first is the digitalization of its own core processes in several different ways by using digital enablers to increase competitiveness by reducing costs for Maire Tecnimont Group companies and for their customers,



DIGITAL TRANSFORMATION: DELIVERING PLANTS FOR THE FUTURE

NEXTPLANT: Our Digital Suite for Operation & Maintenance developed off-the-shelf and tailormade solutions to proactively meet Client needs



Digital Transformation Can Contribute To Energy Transition

and by speeding up the bidding process and project execution. Second is the enhancement of operation and maintenance of industrial complex through product and service branded as NextPlant.

Our digital portfolio initiatives have allowed the group to better manage the EPC work sequences, leading to improved control of project execution times, and greater control of Health, Safety, and Environment (HSE) aspects during construction.

The digital platform through NextPlant

will help our clients to attain their goals in energy transition by leveraging on digital technologies. It also helps our customers to unlock value both during the EPC phase as well as during plant operation.

The Group is expanding its digital portfolio to include products and services that can reduce the operating costs of industrial plants, improve their sustainability by lowering CO2 emissions (for example by using process optimizers), reduce the risk of accidents affecting people (by geo-tracking of workers) and the environment (through for example the predictive maintenance), and facilitate the transfer of skills as well as create new job opportunities (through advanced training systems that will combine conventional operator training simulator with virtual reality scenario). Next steps are the adoption of 5G to facilitate the implementation of extensively interconnected future industrial complexes and the application of blockchain technologies especially on green chemistry arena.

For energy transformation plants, the application of blockchain technology is a unique value proposition in the market. The blockchain combined with process optimization, for Maire Tecnimont licensed units, can be used to certify the carbon footprint of the feedstock. Meanwhile, it can be used to certify output products (to obtain green premium incentives). Besides this, the digital twin process can be used to optimize yield of plant and reduce emissions (to demonstrate the contribution to the decarbonization process for scope 1 emissions). Feedstock certification can ensure access to incentives and contribution to the decarbonization process.

How did Digitization empower your workforce to accelerate growth?

In the ongoing calendar year, the Group has envisaged partnerships with several global companies like SAP, Aveva, Siemens and Leonardo to address several industrial challenges through digital initiatives. In early May this year, the Group through its subsidiary Tecnimont had signed a MoU with Aveva, a global leader in industrial software, driving digital transformation and sustainability, to create new digital predictive and prescriptive maintenance services that drive enhanced business outcomes.

AVEVA's Asset Performance Management (APM) solutions will be used across the Maire Tecnimont Group, globally, which will help enhance plant operability and lower maintenance costs. As part of the agreement, the two companies will work together on a defined number of customer projects to promote the application of predictive maintenance technology for critical plant assets.

In May itself, the Group and Leonardo signed an agreement for supporting industrial evolution through the design of next-generation greenfield and brownfield plants in the transformation of natural resources and in green chemistry sectors, providing integrated solutions for cyber security and for the digitalization of operational processes. The Group and Leonardo have agreed to collaborate in three areas like cyber security, digitalization of projects, and industrialization of the green economy.

In a move aimed at further strengthening its digital solutions portfolio NextPlant, our main EPC contractor Tecnimont **COVER STORY**

and Siemens Italy signed a MoU to offer cutting-edge digital predictive maintenance services to help clients increase plant operability and reduce maintenance costs. As part of the agreement, the Group will leverage its expertise as an EPC contractor in the natural resource transformation industry, to supply plant owners with artificial intelligence applications, based on Siemens Predictive Analytics technologies, for asset monitoring, performance evaluation and equipment maintenance.

Continuing with our decarbonization path and accelerating the digital transformation, our Group shifted its business processes

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onto cloud computing by choosing RISE with SAP. The partnership with SAP will also support the Group in achieving its carbon neutrality targets for 2030 and 2050 for both Scope 2 indirect emissions, which are related to the consumption of "purchased energy", and Scope 3 indirect emissions, i.e. all emissions generated for the provision of services included in the agreement with SAP.



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Towards Decarbonization of Refineries: CO2 Capture to EOR usage



Girish Shirodkar Partner, Strategy&

Decarbonization in refineries

India's has pledged to achieve Net Zero

to set targets for decarbonizing their operations. Countries are focusing on a transition to renewables, green hydrogen,

by 2070. The announcement at COP 26 is expected to have ramifications across carbon intensive industries including power, cement, steel, and refining. In response to India's Net Zero pledge, many oil and gas companies are expected



¹ Efficiency mechanisms include reducing emissions across operations, assets, process, and energy in manner that does not affect output Source: Strategy& analysis

and efficiency improvements, to reduce their carbon emissions. But no country is planning for zero carbon emissions. Hence the importance of carbon capture, usage, and storage (CCUS) to reach the Net Zero goals (see Exhibit 1).

CO2 capture and usage around the globe

The key to tangible action will be the existence of CO2 capture sources and sinks, ensuring steady capture and subsequent usage/ storage. CO2 is an important input in a range of commercial processes. According to IEA estimates, 230 million tonnes (Mt) of carbon dioxide (CO2) are consumed every year. The fertilizer industry is the largest consumer (130 MtCO2 used primarily for urea manufacturing), followed by oil and gas industry (70 to 80 MtCO2 used for enhanced oil recovery). Food and beverage, metals, and other industries (such as cooling, fire suppression and agriculture) consume around 20 Mt CO2 (see Exhibit 2).

Urea manufacturing uses CO2 emitted during the ammonia manufacturing process and hence does not require external CO2. Thus, EOR remains the

Exhibit 2

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Global CO2 consumption by sector (Mtpa)



Source: IEA, Strategy& analysis

Exhibit 3 Mega CO2 EOR projects across the globe (> 0.8 MtCO2/yr)



Source: KAPSARC data portal, Strategy& analysis

largest user of CO2 captured/ produced from anthropogenic sources.

Globally, a push towards decarbonization has led to an increase in carbon capture projects and CO2 EOR is being increasingly adopted. Currently, ~170 CO2 EOR projects are in operation globally, leveraging natural (underground CO2 fields) or anthropogenic CO2 (captured CO2 from industrial processes such as natural gas processing, hydrogen production, fertilizer production, oil refining, and power generation). As per 2018 KAPSARC data, there were 23 largescale CO2 EOR projects (>0.8 Mt CO2 per year) at different project stages, out of which North West Sturgeon is an oil refining-based CO2 EOR project (see Exhibit 3).

CCUS value chain analysis

CCUS involves the capture of carbon dioxide (CO2) from industrial processes, and transport of this CO2 via pipelines or ships, and usage as a resource to create valuable products or services or permanent storage in geological formations (e.g., oil reservoirs and saline formations) (see Exhibit 4).

Exhibit 4 CCUS value chain

Capture	Transport
 Capture at point sources of emission in industrial process 	 Transport usin pipelines or sh

using or ships • Storage at geological formations (e.g., oil

Storage

reservoirs, saline)

The costs of capturing CO2 vary for every industry, as the process of capture and concentration of CO2 streams differ. The levelized cost to capture CO2 is low in high CO2 concentration streams such as gas processing plants & ammonia production, and high in low concentration streams such as power generation, iron & steel, cement. As per IEA data, natural gas processing and fertilizers have costs of capture ranging from \$15 to \$25 per tonne of CO2 captured whereas sectors such as power, cement, iron & steel

have costs ranging from \$50 - \$100 per tonne of CO2 captured. At refineries, capture can be done at power generation units, hydrogen producing units, or fluid catalytic cracking units, with hydrogen units the most economical options (see Exhibit 5).

Exhibit 5 Levelized cost to capture CO2 by sector – USA (\$/tonne)



¹ CLC stands for Chemical Looping Combustion, which is a novel technology for CO2 capture at Fluid Catalytic Cracking (FCC) Units in refineries Source: IEA, IPCC, Strategy& analysis

Exhibit 6 Cost to transport CO2 (\$/tonne/250km)



Source: IPCC, Strategy& analysis

Pipeline remains the most used and economical mode of transport of CO2 for EOR across the globe. Economies of scale reduce the cost of transportation, and higher flow rates offer lower costs (see Exhibit 6). Transport by ships will be used in some projects (e.g., Northern Lights project, Norway) but remains costlier over smaller distances. In countries with significant scale of EOR projects (E.g., USA & Canada), extensive networks of CO2 pipelines already exist. Additionally, transportation of gases via pipelines is a mature technology, and CO2 pipelines can co-exist with already laid fuel pipelines.

Geological storage of CO2 can be undertaken in a variety of geological settings in sedimentary basins. Within these basins, oil fields, depleted gas fields, deep coal seams and saline formations are all possible storage options. Estimates of cost for storage in saline formations range from \$0.5 to \$8.0 per tonne of CO2 stored, with lower costs for onshore, shallow, high permeability reservoirs with reuse of wells/ infrastructure of old oil fields. When storage of CO2 is combined with economic oil recovery (EOR), the monetary benefits of enhanced production offset a part of the capture and storage costs.

Capture cost considerations within a refinery

Within a refinery, there are multiple point sources of emission, with each source having a different cost of capture. A typical world scale refinery (with a capacity of 300,000 bpd, and area of 5 sq. km) will usually include a cogeneration plant, a gasifier, flue gas stacks, turbines, fluid catalytic cracking unit (FCC), and several smaller scattered emission sources. Concentration of CO2 in capture streams vary from 99%+ for gasifiers, 12% for FCC and 4-12% for combined stacks and cogen plants. Total CO2 emissions vary for each point source, with cogen, gasifier and large combined stack producing ~1 MtCO2 per year and FCC, smaller combined stacks producing ~0.5 MtCO2 per year. High concentration and high-pressure sources are the least costly for capture and are mainly found at the hydrogen production units (gasifiers). Large flue gas sources such as stacks from furnaces, turbines offer the lowest costs for post-combustion capture. Several smaller, scattered sources

Exhibit 7

CO2 emission point sources at a typical world scale refinery¹



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¹ 300,000 barrel per day, 5 square km Source: Elsevier, Strategy& analysis

that are spread out across the refinery are not economical options for CO2 capture, as costs to duct and aggregate flue gases become prohibitive (see Exhibit 7).

At hydrogen production units, capture of CO2 is currently accomplished through the acid gas removal process using solvents – chemical (e.g., MDEA and other amines) and physical (e.g., Selexol, Rectisol). At cogen plants and flue gas stacks capture of CO2 is accomplished through postcombustion capture (PCC) technologies. PCC technologies use either aqueous pure amines or blends of amines for capture of CO2.

Refinery CO2 capture within the Indian context

As Indian refineries reduce their emission intensity via CCUS, large volumes of captured CO2 will need to be stored. Saline formations could be a possible sink. However, to exploit the benefits of incremental oil production, EOR is a better option. Coupling CO2 capture with EOR will enable favorable economics for CCUS projects. Further, recovery of oil from mature or declining assets will result in boosting domestic production, which remains India's goal in the short-medium term. Carbon capture in refineries can

COVER STORY

Exhibit 8 Map of high potential areas from a CO2 EOR perspective



Source: PPAC, Strategy& analysis

provide an impetus for CO2 EOR projects by ensuring a steady supply of CO2 for EOR purposes.

A critical factor in implementation of CO2 EOR projects is the overlap between CO2 sources and sinks. As the cost of transportation in pipelines is proportional to the distance, having sources and sinks nearby reduces the costs. A good overlap between refineries and operating oil assets reveals good potential for CO2 EOR in India (see Exhibit 8). Large-scale CCUS deployment results in the linking of proximate CO2 capture 'sources' to clusters of storage 'sinks'. In India, these clusters are likely to be formed in the areas shown in Exhibit 8.

Policy interventions to promote CCUS

Analysis of global CCUS projects reveals that the governments play a crucial role in provision and implementation of projects. Most of the CCUS projects face unfavorable economics due to the high cost of capture involved. Globally, policy instruments used to promote carbon capture and subsequent EOR include regulatory requirements, grant support, provision by state owned enterprises/

Exhibit 9 Policies that have enabled large-scale CCUS facilities

	Tax credit or emissions credit	Grant support	Provision by government or SOE ¹	Regulatory requirement			
US							
Canada							
Brazil							
Norway							
UAE							
Saudi							
China							
Australia							
Prevalence in facilities: Yes							

Source: IEA, Strategy& analysis

full funding, and tax/ emission credit (see Exhibit 9). USA gives emitting companies \$35 per ton of CO2 that is used commercially and \$50 per ton that is permanently sequestered. Similarly, Canada gives \$30 per ton of CO2 captured and used in EOR. Most CCUS projects in USA and Canada are funded jointly by the govt. and facility operators (E.g., Northwest Sturgeon Refinery received grants to the tune of 50% of estimated capex of \$1 Bn). Projects in Brazil, Middle East, China etc. are mostly provisioned by the govt. or state-owned enterprises (E.g., Abu Dhabi CCUS is funded by the Emirate's strategic industrial investment fund).

Four imperatives for translating ambition into action

There are four imperatives that the government should follow to generate tangible action.

Analyzing existing oil fields to gauge potential of EOR application

- The government should provide funding to identify oil field assets across the country which could benefit from CO2 EOR.

Researching novel ways to reduce cost of capture

- Research should be focused on high emission and currently least cost areas like power and refineries.
- R&D funding mechanism should be set up for CCUS research at national universities.
- Government grants should be provided for initial pilots integrating source, transportation, and sink.

Devising a pricing support mechanism to ensure viability of CCUS projects

- Emission credit (similar to the US policy of USD 30 per ton of CO2 which is used for EOR) which partly covers the cost of CO2 capture.
- Waiving of royalties /cesses on additional oil produced through CO2 EOR.

Ensuring availability of CO2 by mandating 'green' requirements for polluting industries

 Over the medium term, as our emission reduction targets get firmed up, key emitting industries should have a mandate for capturing part of their CO2 emissions¬.



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Improving Reliability to Achieve Top Quartile Performance

Anil Bhatia drives the growth of Emerson Automation Solutions for multiple business groups, focusing on providing process automation solutions across industries, with major focus on digital transformation. In his contribution for CEW, he extensively shares about Reliability Value Chain, achieving top-quartile performance, and how digital solutions can solve unforeseen downtimes.

> n the past few years even prior to COVID hitting us, assetintensive organizations in the process industry were turning

towards digital technologies and the Industrial Internet of Things (IIoT) to help improve a critical area of their businesses: equipment reliability. Asset performance management programs that connect data and trigger actions via systems across the business can play a major part in improving equipment reliability. It is evident that organizations that are familiar with the elements of high reliability predictive analysis, autonomous operations, remote monitoring, and deference to expertise—have managed the pandemic better than others. I strongly predict the whole industry will embrace and implement digital strategies for predictive analysis at a much faster pace then what we could imagine.

One of the major concerns of CEOs across the globe is running operations safely and reliably and preventing unforeseen downtimes leading to business losses. Reliability is very critical to overall business performance including safety, sustainability, maintenance costs, and production levels.

That brings me to the key objective of my message, which is achieving top-quartile reliability returns. Let's start with the "Reliability Value Chain."

Improving each ring in the reliability value chain shown below and improving the links between them, leads to significant



The Reliability Value Chain, Ensuring all the links in the reliability value chain work in sequence is a giant step towards top-quartile performance.

reductions in maintenance costs as well as fewer unscheduled shutdowns or slowdowns.

Reliability is a set of well-linked elements in four categories: data, information, knowledge, and action. Ultimately, the ability to achieve top quartile performance status is dependent on the robustness of each element and, perhaps more importantly, on the effective connectedness of all of the elements into a continuous improvement cycle. One of the topmost goals of most organizations today is connecting and utilizing information across the enterprise, which makes it possible to leverage cloud applications and connected services. This approach can help companies reach topquartile performance and using this type of benchmarking process, illustrate the operational benefits of being a top-25%-performing company.

Traditionally, reliability was often a euphemism for maintenance...making sure you had the right staff to repair and replace assets guickly to minimize

downtime. But today, industry leaders realize that a proactive, management-led reliability strategy is the secret to improved shareholder value. It is a most effective tool to improve operational performance, improved production availability and lower operating costs. It also keeps organizations off the evening news for safety incidents.

Unscheduled downtime caused by equipment failure eats into both overall operational budgets and production targets, and that is why is focused



Turn your data into proactive decisions that boost operational performance

techniques, Plantweb Optics can detect abnormal behaviour of process and assets in real time and predict future performance. This shortens the decisionmaking process, preventing further performance deviation and safety issues while maximizing plant efficiency.

Using artificial intelligence

and machine learning

on operational analytics that improve manufacturing plant production and reliability, as well as all the other aspects

of operations that are key priorities for any process industry. Emerson's PlantwebTM
 Optics platform is out-of-the-box process data analytics software that collects and interprets operational information scattered across plants, eliminating the need for gathering, analysing, and reasoning over data and information from control systems, databases, plant applications, and operation procedures.

"Reliability, safety and energy has been priority because of high cost of operations if not attended to suitably, add to that now environmental sustainability and decarbonisation."

There are large opportunities for companies to achieve and sustain top quartile operational performance beyond core process control. Decades ago, digital process control directed actions to outputs like control valves and pumps to achieve optimal performance, the outcome of which was finely tuned machines and processes. This proven and streamlined process created a lot of value over the years. The opportunity with digital transformation is to do the same thing in other areas of operation that are equally as valuable in terms of profitability. Reliability, safety and energy has been priority because of high cost of operations if not attended to suitably, add to that now environmental sustainability and decarbonization. These areas require extensive collaboration across functions,

business units, suppliers and partners straddling geographies and don't have the benefit of the same codified knowledge and relevant time data to drive bestin-class behaviour. Additionally, these processes are often time-consuming and variable due to a lot of manual processes, siloed databases and systems and cumbersome work order procedures.

Emerson provides its customers with a scalable and secure portfolio of transformational technologies, software and services that provide relevant personnel with enhanced insight to drive top-quartile performance.

References:

https://www.emerson.com/en-in/expertise/automation/ top-quartile-reliability

https://www.emerson.com/en-us/automation/ operations-management-software/plantwebopticsplatform/plantweb-optics-analytics



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Anil Bhatia Vice President & Managing Director – India Emerson Automation Solutions

Author

Titanium Dioxide Production -Black Liquor Crystallization and Spent Acid Concentration

itanium is a common element in the earth's crust and all common titanium minerals are oxides. Ilmenite is the most important titanium resource and supplies about 90% of the worlds demand for titanium minerals. The significance of titanium is tied to the production of white pigments that are primarily used in paints, paper, and plastics. Two main processes are used to manufacture pigment grade TiO2, namely the sulfate process and the chloride process. In this study, we will demonstrate the purification and concentration processes associated with the sulfate route, with special emphasis on black liquor crystallization and spent acid concentration.

Titanium is the ninth most abundant element in the earth's crust and is primarily found in the minerals rutile (TiO2), ilmenite (FeTiO3) and sphene (CaTiSiO5). Ilmenite is the most important titanium resource and supplies about 90% of the worlds demand for titanium minerals [1]. The stoichiometric content of TiO2 in ilmenite is 52.66 wt.-%, but this value can be significantly lower due to the preferred substitution of Ti by Fe. Incorporation of other mineral impurities or Ti losses by insufficient processing are also common. The lower the TiO2 content of the ore, the lower its commercial value.

The significance of titanium is tied to the production of white pigments that are primarily used in paints, paper, and plastics. At present, approximately 89 % of the natural titanium minerals extracted worldwide are used for the production of TiO2 pigments [2].

Two main processes are used to manufacture pigment grade TiO2, namely the sulfate process and the chloride process. Although the chloride process has some advantages over the traditional sulfate process in both cost and waste management, the sulfate process is more


The sulfate route for ilmenite:

In the sulfate route [3], finely ground ilmenite ore (> 44 % TiO2) is dissolved in concentrated sulfuric acid (92-106 % H2SO4). During the dissolution process, the metal oxides contained in the ore react to ferrous sulfate (FeSO4) and titanium oxysulfate (8-12 % TiO2):

FeTiO3 + 2 H2SO4 \rightarrow FeSO4 + TiOSO4 + 2 H2O

Prior to further processing, the ferrous sulfate can be removed from the Ti-rich solution by means of cooling crystallization ("black liquor crystallization"). Consequently, the concentration of FeSO4 in the solution is decreased and the TiO2 concentration of the solution is increased to about 20 to 25 %.

The dissolved titanium oxysulfate is converted into titanium oxide hydrate by hydration in large boiling vats, and the hydrate is separated from the diluted acid by filtration:

 $TiOSO4 + 2 H2O \rightarrow TiO(OH)2 + H2SO4$

After further filtration and washing, the

hydrate is calcined to generate the final TiO2 pigment.

Black liquor crystallization:

As mentioned above, the ferrous sulfate can be removed from the titaniferous solution due to its lower solubility. Upon cooling of the feed acid from 60 °C down to 15 °C, green copperas crystals are formed (FeSO4·7H2O), which can be separated from the solution by means of centrifugation (see Figure 1). The crystallization unit consists of an agitated crystallization vessel equipped with steam ejector, condenser, vacuum unit, and discharge pump, and can be operated batch-wise or in continuous mode.



Figure 1: Black liquor crystallization

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Spent acid concentration:

Depending on the raw material, for each ton of TiO2 produced using the sulfate process, about 2.4 to 3.5 tons of concentrated sulfuric acid are required [2]. In addition to copperas, significant amounts of dilute sulfuric acid (20 % H2SO4) are produced. The total volume of spent acid caused by this process amounts to approximately 6 to 9 tons per ton pigment [2]. This dilute and contaminated acid cannot be processed further. Therefore, the spent acid is recovered and concentrated by evaporation and the contaminants are filtered out.

Pre-concentration of the spent acid usually takes place in forced circulation (FC) evaporators in three effects, to reach approximately 70 % H2SO4. At this



Figure 2: Spent acid pre-concentration

FEATURES



Figure 3: Overall process scheme of black liquor crystallization and spent acid concentration

concentration level, iron sulfate has a minimum solubility. The evaporator steps 1 and 2 are operated in series to minimize energy consumption, whereas evaporators 1 and 3 require primary steam (see Figure 2).

After pre-concentration, the acid is aged in big storage tanks equipped with cooling coils. At this concentration, the solubility of most metals in sulfuric acid is lowered to such a degree that contaminants can be precipitated and separated by filtration. The almost salt-free acid produced in this way can now be recycled directly or further concentrated (see overall process scheme in Figure 3).

The final concentration up to 90 % H2SO4 takes place in two evaporation steps. The cooling medium of the vapors of the second concentrator is the feed of the first concentrator. This means that the flow sequence of the acid is: condenser of the second concentrator, first concentrator, second concentrator, cooler. Product acid leaves the cooler at a temperature of 60 °C and a concentration of roughly 90 %, including about 5 % impurities as metal sulfates.

Forced circulation evaporation is most commonly applied but falling film can be also be considered if the acid is relatively free of salts.

References:

-Titanium mineral Concentrates, U.S. Geological Survey, Mineral Commodity Summaries, January 2021.

-Elsner, H.: The HiTi feedstock market – rutile, leucoxene and others, DERA Rohstoffinformationen 46, 357 pp., Berlin, 2021

-Large Volume Solid Inorganic Chemicals – Titanium Dioxide, Final Report, Federal Environmental Agency,

June 2001.

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Digitalization & Automation Accelerating Industrial Enterprises





G Balaji VP (Head Energy Industries- Process Automation) ABB India

G Balaji is head of Energy Industries division in Process Automation, ABB India. He is also member of Country Management Committee that shapes critical management strategy. He shares his erudite viewpoints and information on the rising energy & chemical industries, digitization, latest technologies and other such integral parameters of the market and ABB.

ndia has pledged reducing carbon emissions by 1 billion tonnes by 2030 and Net Zero by 2070. What kind of opportunities do you see for ABB in this drastically changing scenario driven by climate change & energy transition?

ABB has been at the forefront of driving thought leadership and innovation to

achieve a greener world. Our vision as encapsulated in a "Sustainability strategy 2030" is centered around helping the world address several of the critical challenges it faces today – reversing climate change being an integral action point. As part of this program, we embed sustainability in everything we do ourselves and for our customers. 77

Stakeholder engagement is an important pillar listed in our global approach. Collaboration, whether in the form of public-private partnerships, consortiums or pilot implementations, is important to ensure that the world achieves its carbon emission reduction and neutrality targets. This is an insight we have gained over 50 years of working with diverse players in the energy space globally.

Our proven track record in the renewables sector – increasingly adopting renewable energy sources into traditional industries – also provides us with the insight and expertise to implement solutions that

focus as much on innovation as on ease
 of implementation. One recent example
is how we are adopting hydrogen as a
powerful alternative energy source – we
are actively working with ECH2A, the
European Clean Hydrogen Alliance, to
identify ways to make hydrogen a widelyaccepted source of green energy.

However, we acknowledge that each country is unique in its energy requirements and the path it adopts to carbon footprint reduction. Therefore, in addition to our global experience, we apply the deep knowledge we have of India's energy sector to drive innovative solutions to propel industry towards a low-carbon future.

ABB is uniquely placed owing to the product portfolio and the segments that

we have been catering to since many decades. Resultant from this experience is our ability to view energy from different perspectives – from the traditional oil & gas, thermal, hydro to the increasingly favored solar, wind and emerging technologies such as green hydrogen. We play a strong role in implementing dependable and efficient hybrid power systems, which demand expertise to be put together in an optimized manner. This expertise is what helps us drive our value addition across the entire energy generation, transmission and consumption chain.

Which technologies will enable industry transformation in the foreseeable future in Indian context? Please share your views on the energy & chemical industries.

The focus has to now shift to higher levels of digitalization and automation. Digitalization is the gamechanger that is enabling safer, smarter and more sustainable operations in a way that saves cost and improves profitability for operators. Digitalization across the value chain will be the primary enabler of smart integration in the energy sector going forward.

At ABB, we have witnessed the advent of digital technologies from the time microprocessors were made popular over a half century ago. From then to 2020, when the world was able to adapt rapidly to the COVID pandemic through the power of digitalization, we have seen how innovation has driven commercial success and business continuity. We are now moving to an era of integrating electrification, automation, field instrumentation and telecommunications as a holistic ecosystem.

This increased level of digitalization is able to drive the decarbonization objective and broader sustainability objectives more effectively than ever – through a combination of remote operations, data-based decisions and the eventual emergence of autonomous operations.

A combination of technologies need to come together for this. Towards this goal, our digitalization offerings, which account for ~35% of our revenues, now encompass:

- Smarter equipment: connected devices connectable which are remotely accessible and easier to use.
- Futuristic control technology: moving from just automation to platformbased concepts
- Evolved data analytics: harnessing cross-functional data generated from multiple sources to provide rich analytics that help customers make better decisions faster

The enthusiastic customer response to our recently launched industrial analytics platform – the ABB Ability[™] Genix suite – is a stellar example of how the industry has rapidly embraced digitalization as a key success enabler.

In context with Indian market, what are the key challenges that will have to address to comply with the environmental norms to reduce the carbon footprint?

The primary challenges and focus areas across industries, whether in energy sector or chemical industries, pertain to identifying potential issues early enough to reduce risk, optimize costs and improve efficiency.

Enterprises in the Indian market are having to adapt rapidly to challenges including:

Streamlining the massive amount of data generated such that it results in insights for operators to make more informed decisions

Ability to standardize project execution with technology solutions that are faster to deploy, simpler to operate and cheaper to maintain

Reducing CAPEX and streamlining OPEX of both greenfield and brownfield projects

Addressing process inefficiencies to maximize output and efficiency

IMPACT FEATURE

What are the major challenges in the chemical industry to revamp the existing facilities (especially for the small & medium scale players) & going further building the sustainable future plants?

Infrastructure that keeps pace with changing trends and acts as a strong contributor to commercial success is a major area of focus across industries today. To build more sustainable plants, enterprises need to adopt smarter practices, while achieving higher productivity from their assets at the same time. Better management of facilities also plays an important role in managing risk,

especially in industries where the potential impact of process failure has potential impact on human life and safety.

Smarter asset management and practices such as predictive maintenance are helping industrial enterprises, including small and medium ones, meet this objective. Greater access to digitalization platforms and automation techniques is also helping accelerate this process. Integrating and implementing these in a seamless manner is a key objective of industries today.

Tell us about ABB's latest innovations & technologies that will enable the Indian chemical processing industries to address immediate challenges & prepare for sustainable growth. ABB's focus in the recent past has on creating an intelligent ecosystem that enhances efficiency, sustainability and resource optimization. ABB products align to the objective reducing emissions, whether directly or indirectly. Our universe of offerings on this front is centered around:

- Drives and motors with higher energy efficiency
- Automation to optimize use of energy and raw material
- Solutions that maximizes utilization of renewable energy sources

As an example of our recent innovations, ABB Ability[™] is an umbrella offering, structured as a fully digitalized solution that allows data to achieve reliable, sustainable output across different sources. Over 200 solutions that form part of this umbrella are designed to help industries meet their strategic objectives, whether on process efficiency, operational excellence, asset management, sustainability, safety or supply chain optimization.

Increasing competitive and economic pressures have resulted in most industries having to reduce strength of in-house experts. This has in turn, led to increased workload pressure and loss of vital historic plant knowledge. These factors (plus adapting to stringent legislation) implies that operators need access to expert assistance to ensure that they stay competitive and aligned to the new world order of smarter, more sustainable operations.

What are the key initiatives taken by ABB India to support the customers in developing operational excellence? Please share your experience & solutions that have been offered to the customers.

Operational excellence is increasingly a factor of comprehensive, holistic support – starting with being a valuable thought resource for customers early in the process. This is focused on enabling operational excellence while introducing enhanced levels of sustainability. The partnership approach is key in this context – we work closely with customers to run gap analysis comparisons with industry benchmarks, identify areas of focus and develop complete solutions.

Further, by adding capabilities such as digitalization, we also helps ensure that operations can be monitored and controlled, and decisions taken faster. This has a direct enhancement on aspects such as environmental commitments, risk management, health, safety and productivity. We are using a wide range of technologies, with industry-specific solutions, to enable these outcomes.

Tell us about the future plans & strategies of ABB Ltd to stay competitive.

The primary answer to this lies in expanding and constantly adding solutions to our digitalization capabilities. We are looking to lead energy transition by putting automation and digitalization at its center. To emerge as the leader in this space, we have adopted a bottom-up approach to digitalization – leveraging our deep domain knowledge, automation expertise and understanding of customer businesses to build digitalization solutions.

With sustainability as a key focus point, we are also actively nurturing our supplier networks to dovetail into the objective of supporting our customers' environmental targets. 80%+ of our supply spend in focus countries is being covered by a supplier sustainability framework, which includes the environment, social and governance performance (ESG). ■

ECTFE SK+ Dual-Laminate Chimney Stack





ECTFE SK+ dual-laminate part of the chimney stack

Project	Replacement of an ECTFE SK+ dual-laminate
	chimney stack
Location	Rio Seco in Peru
Installation	2020
Dimension	DN 500 mm with a height of 60 m
Products	ECTFE SK+ fabric backed sheets, cap-strips
	and welding rod
Media	Sulphuric acid fumes
Temperature	80 °C
Pressure	Ambient

The purpose of this project was the replacement of a chimney stack for a sulphuric acid plant at Rio Seco in Peru. When processing the occurring flue gases, aggressive media can form as a by-product. Since these media are very corrosive to metals and many other plastics, a dual-laminate solution using ECTFE SK+ liner material and fibre reinforced plastic (FRP) was the material of choice. Applications made of fibre-reinforce plastics are lined with fabric backed sheets to maintain chemical resistance and leak-tightness. The FRP ensures the compressive and



Y-Tee on part of the chimney stack

mechanical strength needed for a safe operation of the system, even under vacuum.

ECTFE possesses a unique combination of properties that are the result of its chemical structure, which consists of a copolymer with ethylene and chlorotrifluoroethylene arranged alternately. ECTFE demonstrates excellent resistance to the corrosive influence of heat, strong radiation, corrosive media and weathering. The material is characterized by high impact resistance and shows almost no property changes within a wide temperature range (- 76 °C to + 140 °C), making it particularly well-suited for demanding industrial applications. Furthermore, ECTFE is known for its good permeation barrier for many chemicals. Compared to PVDF, ECTFE has a better chemical resistance, especially when exposed to lyes. SK+ is a special synthetic knitted fabric and offers excellent chemical resistance against strong acids like



Plant in Peru (Chimney frame in the middle)

hydrochloric acid and resistance against hydrolysis by permeating water.

One of the technical challenges in this project was the conceptualization of a Y-Tee on the chimney stack. While the three-dimensional geometrical form was already very demanding for the preparation of the welding process, welding from the inside was practically impossible because of the inner diameter of only 500 mm. Therefore, the outer welding had to be done very carefully to ensure leak-tightness and enough mechanical strength.

For more information

https://www.agru.at or office@agru.in

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Reliable Plant Operation -Day In, Day Out



In the chemicals industry, we know your plant never sleeps. It simply needs to keep working reliably, day in, day out, in the toughest environments and without any unexpected downtime. At Danfoss, we enable that with the highestquality AC drives to keep you going, while at the same time lowering your energy consumption.

For your chemical plant to run at its absolute best, you need drives that enable peak performance. Designed with decades of industry knowhow, our quality VLT® drives deliver best-in-class reliability and robustness. Their leading energy efficiency lowers your total cost of ownership and helps reduce the carbon footprint of your plant. Further, predictive and condition-based monitoring are built into our drives to give you the intelligence you need to future-proof your systems.

Danfoss VLT[®] AutomationDrive FC 301/302 are fully compatible with any



VLT Automation Drive 302

motor or system, so you're free to run the optimal system for your plant. With the deeper understanding of the industry, we engineered VLT® AutomationDrive FC 301/302, which delivers best-in class reliability and robustness. VLT Drives can help you reduce energy consumption and the total cost of ownership, which can help you to achieve 24/7 uptime with maximum productivity for your plant. Regardless of whether you are commissioning a new plant or converting an existing one, drawing on the expertise and experience of suppliers during planning and implementation is the only way to arrive at fast and effective drive solutions.

As a supplier of drive technology, Danfoss offers over 40 years of experience as a global partner. Whether you need a module, a control cabinet or a complete drive system including motor, Danfoss' specialists are available to supply tailored solutions based on your specific plant data.

Our drives have reinforced conformal coating, high IP ratings of up to IP 66, ATEX compliance, thereby withstanding high ambient temperatures of up to 50 °C, offering reliable protection against dust and moisture and extend the lifetime of the drive and critical components. It optimizes processes and save energy with dedicated chemical VLT® drives solutions.

VLT[®] AutomationDrive is equipped with excellent backchannel cooling, which passes more than 98% of the supplied electrical energy on to the motor, with only 2% or less is left in the power electronics that needs to be cooled. This will lower energy usage with minimal application wear and saves up to 20% of energy consumption. Our drives can be used with 150m shielded or 300m unshielded cable starting from 1.5 kW without any additional output filters for motor connections. This saves investment and space enabling full output torque on the motor shaft.

The integrated condition-based monitoring in VLT Drives, analyses the irregularities and resolves the critical issues like motor winding failure, vibration wear, mechanical misalignments and wear-out, thereby reducing unexpected downtime and increases the lifetime of your applications.

All our AC drive units are built on a modular design concept that makes them extraordinarily versatile. With a power range of up to 5.3 MW, the drives can be expanded with a wide range of additional features that make them especially suitable for the chemical industry. The AC drives combine a flexible system architecture, which allows them to be adapted to specific applications, with a uniform user interface across all power classes. Their easy integration into any plant's automation system is possible thanks to fast fieldbus options and exceptional programming flexibility. ■

For more information

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Setting the Industry Standard with Sandvik Mehsana Mill





Opening new possibilities for customers

Last year, Sandvik added a new cold finishing tube manufacturing line at its Mehsana mill in Gujarat, western India, to increase the availability of its highquality seamless stainless tube, meet the growing demand for special alloy tubes, introduce new grades and strengthen regional service. The cold finishing tube manufacturing line, mainly aimed at the production of heat exchanger tubing and for other demanding industrial applications, doubles Mehsana's coldworking capacity and thus allows for swifter delivery times across the Asia Pacific region.

As part of our ongoing commitment to customers in India and the Asia Pacific region, Sandvik improves the availability of our top-quality products, broadens the portfolio, and becomes the most reliable, one-stop shop in the region. Together with fabricators and endusers, we continue to expand on new opportunities to boost productivity and extend the lifecycle of their equipment



MATERIALS.SANDVIK/SANICRO-35

Video Link: https://youtu.be/Q-Jel3ihqyc

with the help of predictable, high-precision tubing – delivered when they need it. The Mehsana manufacturing facility has been successively expanded and modernized in recent years focusing on boosting capacity, adding new grades and sizes, and constantly improving to meet the highest global quality standards including ASTM, ASME, EN, NACE 0101/0175 as well as customer specifications.

Enhanced cold pilgering

The cold-forming process, which involves drawing and shaping the tube, is used to impart higher strength than found in the initial annealed condition. To achieve the highest straightness, low eccentricity, and tight dimensional tolerances, Sandvik employs our own patented cold pilgering technique to create a greater variety and quantity of tubes to meet our customer needs. The new cold finishing line will focus on heat exchanger tubes in austenitic, duplex, and nickel alloys, which can be supplied straight or U-bent for shell-and-tube heat exchangers – cleaned and plugged.

Cold finished seamless stainless tube from Sandvik is especially popular among fabricators and original equipment manufacturers (OEMs) using hightemperature heat exchangers with special requirements for resisting corrosion and high temperatures. The tube is used in a wide range of industries such as petrochemical, oil & gas, chemical, fertilizer, and others.

IMPACT FEATURE



Setting the industry standard

The Mehsana mill is a key pillar in our strategy of being a reliable global supplier of advanced corrosion-resistant alloys, with a focus on materials expertise, innovation, and setting the standard in our niches. By setting new industry standards with our high-performance materials, we strive to offer customers peace of mind through increased reliability and enhanced corrosion resistance for the harshest conditions.

Our high value-added products and services are aimed at helping our customers fulfill – and even exceed – their productivity and performance expectations. In creative partnerships, we develop innovative solutions designed to pave the way to the success of our customers.

Fully integrated and sustainable production

Sandvik maintains a highly integrated and sustainable manufacturing process, with tubes made from 84-percent recycled

metal using efficient manufacturing processes. Driven by a "zero defects" philosophy and ambitious targets, the mill secures full traceability from melt to final tube. This means that individual heat exchanger tubes can be traced in every step of the production process back to the individual melt, heat and lot. This gives customers full control over their product, empowering them to install or modify the material with full knowledge of its production history. Additionally, every tube undergoes a battery of chemical and mechanical tests, including positive material identification (PMI), so customers always know the material they receive is what they ordered.

Wide range of tube sizes and grades

The Mehsana mill tube program covers ANSI pipes, redraw hollows, heat exchanger tubes and high-temperature tubes. Tube grades comprise a wide range of corrosion-resistant alloys (CRAs) – from



Man welding a multitubular heat exchanger

austenitic and super austenitic to duplex, super duplex, and nickel alloys.

Expanding nickel alloys

Many customers know about our austenitic and duplex programs but are surprised to learn that we have a growing range of nickel alloy grades. Many of these products fall under our Sanicro[®] brand, such as Sanicro[®] 30 (Alloy 800), Sanicro[®] 41 (Alloy 825), Sanicro[®] 70 (Alloy 600) Sanicro[®] 625 (Alloy 625), Sanicro[®] 56 (Alloy C276) to name a few. The Mehsana mill offer tubes from 12.7 mm to 50.88 mm dimensions with no limitation on quantity.

New cost-efficient super-austenitics

We're also very excited to be developing some all-new super-austenitic grades that will in many cases bridge the properties gap, at higher temperatures, between standard duplex/austenitic grades and more costly nickel alloys. All these alloys will be manufactured in our new facility



increasing our range and local service offer to our customers. Sanicro® 35 bridges the properties gap between super austenitic steel grades and more expensive nickel alloys. Sanicro® 35 is available in Heat Exchanger Tubes, Hydraulic and Instrumentation Tubing, and regular tube and pipe form. The material provides a new, high-performance alternative to conventional high nickel alloys and super austenitic alloys to support more costeffective and efficient operations.

Recently, we received the first full order for our Sanicro[®] 35 grade that bridges the performance gap between stainless steels and higher-cost nickel alloys. The order encompasses supplying tubes for two heat exchangers used in a crude unit



Sanicro® 35 bridging the gap

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fractionator at a major refining company in the U.S. Gulf Coast.

Hydraulic and Instrumentation tube production

The Mehsana mill is an important facility in our journey towards increasing our footprint in Asia. As part of our strategy to invest capacity and capability in growth markets, the new Hydraulic and Instrumentation tubing factory, as well as the extensively revamped finishing facilities for the heat exchanger flow, will enable us to meet our customers growing needs created by the change towards increased natural gas in the energy mix.

For the past few years, we have been focusing on boosting capacity, adding new grades and sizes, and constantly improving to meet the highest global quality standards as well as customer specifications. This new investment will provide a significant transformation in our portfolio and improve the utilization and productivity of the existing heat exchanger line. It will also expand the Hydraulic and Instrumentation Tube capacity to meet the growing market for infrastructure around natural gas.

We look forward to ramping up on our production to cater to the increasing demand for locally manufactured products in India

while aligning with the Government of India's "Make in India" and "AtmaNirbhar Bharat" or "Self-Reliant" program. We also look forward to enabling further export and swifter delivery times to customers across the region.

Conclusion

With an increased capacity of products and solutions for our local customers, the Mehsana mill has set the standard for customer support, expertise, and innovation. We are excited to see what the future entails for the Mehsana mill serving the local and regional market.

For more information

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GMM Pfaudler launches Interseal ace5000™



GMM Pfaudler, a leading supplier of engineered equipment and systems for applications in the global chemical and pharmaceutical markets,

has launched Interseal ace5000[™], an innovative sealing technology which works on the principle of multiple lip-sealing technology. It not only eliminates the requirement of a barrier-fluid but also any chance of seal-face contamination into the product. This state of the art innovative sealing technology reduces cost of ownership and eliminates any chance of seal-face contamination into the product

The ace5000[™] helps reduce the total cost of ownership and runs completely dry. It comes with a predictive failure feature that allows for planned maintenance preventing sudden seal failures. This product can be used in all types of applications such as API, cGMP areas, sterile operations, crystallization, high vacuum, finish product area, high viscous process, and frequent seal failures.

Technical parameters & sailent features of ace5000™

- Shaft diameter: 40 160 mm
- Pressure: Full vacuum to 6 bar
- Temperature: -40 °C to + 220 °C
- Maximum sliding velocity: 3 m/s
- No supply system needed
- No loss of product because of contamination
- No continuous cleaning of contaminated supply system
- No constant monitoring necessary due to patented dry running technology

Contact:

www.gmmpfaudler.com

ECOM Presents Visor-Ex® 01 Smart Glasses for Industrial Use in Hazardous Areas

The Pepperl+Fuchs brand ECOM Instruments, together with its cooperation partner Iristick, is introducing Visor-Ex® 01 smart glasses for industrial use in hazardous areas. The intelligent wearable combines high camera quality and reliable communication features in an ergonomic design for user's utmost comfort – with a weight of just 180 g, making them the optimal solution for mobile workers for all





tasks that require hands-free use as well as continuous communication. In addition, pick-by-vision is a common scenario especially in logistics.

The intrinsically safe smartphone ECOM Smart-Ex® 02 as a computing unit, combined with a pocket unit with replaceable battery for power supply, creates an intelligent ecosystem for a wide range of applications. Visor-Ex® 01 can be easily attached to a safety helmet with a clip, or the device can be attached directly to the wearer's head with a strap and worn as a head-mounted device. Two joints on the variable extension arm of the OLED display ensure unrestricted vision. The distance to the eye and the field of vision can thus be flexibly adjusted.

Global support through the Pepperl+Fuchs network ensures the necessary operational security and rapid assistance. Local contact persons and application engineers are available quickly and directly to deal with questions, solve problems or carry out repairs as quickly as possible.

Contact: www.ecom-ex.com/ www. pepperl-fuchs.com

Measuring Methane in Natural Gas, Biogas, BioMethane Upgrading, Co-Generation



FCI-ST80 Methane FM WBKGD1

Engineers responsible for methane-fueled electric power co-generation systems, oil/ gas production and storage, and pollution control, will find the ST80 Series Thermal Mass Flow Meter from Fluid Components International (FCI) is the solution to measuring methane (CH4) and providing emissions data to meet emerging government environmental regulations and reporting requirements.

As a greenhouse gas, methane remains in the atmosphere for approximately 9 to 15 years according to various U.S. and global government sources. CH4 is over 20 times more effective in trapping heat in the atmosphere than carbon dioxide (CO2) over a 100-year period and is emitted from a variety of natural and human-influenced sources. Sources of methane emissions include: natural gas and petroleum systems, landfills, wastewater treatment plants, agricultural activities, coal mining and other industrial stationary and mobile combustion processes.

The ST80 Series Flow Meter features FCI's Adaptive Sensor Technology[™] (AST[™]), which is an innovative, patented hybrid sensor drive. The ST80 Series Flow Meters are suitable for pipe diameters from 1 to 99 inches (25 to 2500 mm) and

air/gas temperatures up to 850° F (454°C). They feature accuracy of ±1% of reading, ±0.5% of full scale and repeatability of ±0.5% of reading with flow rates as low as 0.25 up to 1000 SFPS (0.07 to 305 NMPS) and 100:1 turndown.

Contact: brownr@rbmarketing.com

Ethercat Plug-In Modules Minimize Space Requirements in Wind Turbines

At this year's Husum Wind, Beckhoff will be demonstrating its many years of know-how and its broad product range for the wind power industry. Among the highlights is a control cabinet optimized in terms of space requirements and wiring effort, which is only possible using the



The EtherCAT plug-in modules and the plug level for sensors and actuators can be placed flexibly on the signal distribution board. The development of a signal distribution board is carried out by the user or as a service by Beckhoff

EtherCAT plug-in modules from the EJ series. In the displayed control cabinet, the I/O level is realized with the EtherCAT plug-in modules and a highly compact, application-specific signal distribution board with a wiring level from stock and preassembled cables. The EtherCAT plugin modules are based electronically on the well-known EtherCAT I/O Terminals and offer the same broad variety of signals. Their electromechanical design enables them to be plugged directly into an application-specific signal distribution board which distributes the signals and the power supply to individual applicationspecific connectors, in order to connect the controller to further system modules. Elaborate manual wiring of single wires is replaced by simply plugging in prefabricated cable harnesses.

Many of the other components that would otherwise be installed separately in the control cabinet are housed as compact plug-in modules on the board, e.g. relays, fuses or surge voltage protection equipment. This means that the space requirement in the control cabinet is significantly reduced, particularly in series production with mid to high quantities, also lowering costs. new release includes a range of product enhancements and capabilities designed to provide intuitive usability, faster timeto-value, and collaboration across the value chain. These include Aspen GDOT for Olefins; Aspen Production Execution Manager (APEM); Aspen Supply Chain Management (SCM) Insights; as well as Aspen Unscrambler.

Contact: AspenTech.com

Contact: info@beckhoff.com

AspenTech Accelerates Customers' Digitalization Journey



Aspenone V12.2 includes new models to help customers identify how to reduce emissions, capture carbon, and enable recycling efficiencies across their entire value chain. It now solutions now include more than 50 models, including many that provide insight into where operational efficiencies can be improved upon in support of Scope 1 and 2 carbon dioxide emission reduction targets.

In addition to sustainability models, the

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